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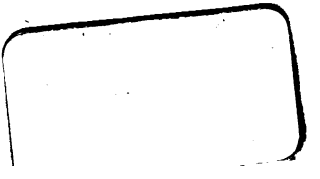
Per. G.A. Wilts 8° 62



REPORT

OF THE

MARLBOROUGH COLLEGE

Natural History Society,

FOR THE

HALF-YEAR,

ENDING MIDSUMMER, 1867.

"TUM MIHI NATURÆ LIBEAT PERDISCERE MORES,
QUIS DEUS HANC MUNDI TEMPERET ARTE DOMUM."

MARLBOROUGH:
PRINTED BY C. PERKINS, TIMES OFFICE.
1867.

Pl. Gough adds. 55 52

26.12.88

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PREFACE.

In taking a general review of the Natural History Society during the past half-year, there is one point which before all others demands notice. It is, that while certain members among the Prefects and others high in the School are gradually moving from among us, their place in the Society is *not* being supplied by others of equal or similar standing.

This is a fact which deserves the serious consideration of the School. It would be very much to be deplored if it should mean a decay of vitality and interest in natural history studies. It would be a much more deplorable thing if it should be a symptom of narrow intolerance felt or displayed against those who pursue, or wish to pursue, such studies. The case stands thus. As lately as two years ago the Society's best friends could say no more than that it was feeling its way; they might invite help and co-operation, pointing out certain probable advantages to those who might be able to co-operate, but they could do little more. Things are now far otherwise. With its growing Museum and Library, its sections, the lectures given in connexion with it, and improved opportunities for rendering the meetings practically useful, the Society is an addition to our resources which we shall certainly be very unwise to underrate or to neglect. It can now offer actual and positive advantages to anyone who by active membership chooses to make use of them. Nor need membership involve any alarming sacrifice of time. A little method and arrangement will enable anyone, however actively occupied in other ways, to learn something worth learning, and to help others who are wishing to make way in the same pursuits. Probably there is no public school in England that would not cordially welcome the transplantation into itself, were such a thing possible, of our existing means for the study of Natural History.

We repeat a sincere hope that the Upper Forms may take these remarks into consideration. It is in the interest of the School, not of the Society, that they are made. The Society neither has, nor can have, any separate interests of its own.

To pass to other matters, our best thanks are due to several kind donors. To Mrs. Gray we are indebted for valuable gifts of sea-weeds and ferns; to E. im Thurn for very numerous gifts of birds; to Mr. Gauntlett for the munificent present of a very fine Golden Eagle; and to Rev. H. E. Booth, Mr. H. A. Evans, Mr. W. W. Fowler, and various former members, for donations of books to the Library. Both Museum and Library are progressing favourably. A detailed report of the Museum will be found elsewhere. It must be remarked, however, that everything that has been done in this department has been the work of individual liberality.

The staple of the papers read before the Society during last half-year, and perhaps the attendance at the meetings (excepting certain special occasions), have shown tokens of weakness traceable to the cause pointed out above. If Members of the Upper Forms do not recruit the Society, it is idle to expect any very promising papers, either in the shape of original work or of useful compilation. It may be added that those who in past days have undertaken such work have often found it excellent practice and training to do so.

With these few words the Report may be left to speak for itself. It will be found to show traces of the same unwearied and unstinting care which watched over the formation of the Society, and without which it never could have become what it is.

LIST OF MEMBERS.

PRESIDENT.

* Rev. T. A. Preston.

SECRETARY.

W. R. Carles.

TREASURER.

T. R. Dumergue.

LIBRARIAN.

R. F. Isaacson.

COMMITTEE.

The Ex-officio Members. R. F. Isaacson.

* T. R. Dumergue. * G. H. Dawson.

EDITING COMMITTEE.

Rev. T. A. Preston.

W. R. Carles. R. F. Isaacson.

HONORARY MEMBERS.

The Rev. the Master.	Rev. J. J. Pulleine.
A. Armstrong, Esq.	Rev. J. F. Bright.
H. M. Moule, Esq.	Rev. J. Sowerby.
W. E. Mullins, Esq.	Rev. H. C. G. Moule.
F. E. Thompson, Esq.	Rev. H. Bell.
C. M. Bull, Esq.	

MEMBERS.

R. B. Mainwaring.	H. M. Hilton.
J. W. Parrington.	E. im Thurn.
T. E. Maclean.	E. Almack.
W. E. Bolland.	A. M. Hardy
A. Herklots.	H. G. Baily.
E. H. Carr.	J. C. Palmer.
A. P. Hockin.	F. W. Head.
J. H. Johnson	J. B. Oakeley.
* F. J. H. Jenkinson.	E. Maitland.
A. C. Hilton.	H. A'Court.
J. E. Hilliard.	P. G. Young.
* W. D. Smith.	G. F. Ruck.

* Heads of Sections.

RULES.

1.—That this Society be called the Marlborough College Natural History Society.

Constitution.

2.—That the Society consist of Members and Honorary Members.

Officers.

3.—That the Officers of the Society consist of a President, Secretary, Treasurer, and Librarian, to be elected from and by Members of the Society.

Management.

4.—That the affairs of the Society be conducted by a Committee, consisting of the President, Secretary, and three other members of the Society, to be elected from and by Members of the Society: three of whom shall form a Quorum.

President.

5.—That in case of an equality of votes, the President shall have a double or casting vote.

6.—That in the absence of the President, the Committee be empowered to request any member of the Society to take the chair.

Committee.

7.—That on the occurrence of any election, each member of the Committee have double the number of votes of any other Member of the Society.

8—That two Members be appointed half-yearly by the Society, to assist the Secretary in Editing the Report.

Secretary.

9.—That the duties of the Secretary be to keep a list of all the Members of the Society, and of all former Members and Benefactors who may wish to receive the Reports of the Society; to summon meetings (when necessary) of the Society; to keep a detailed report of the proceedings, as well as lists of Members and Visitors present at each meeting, and generally to act under the direction of the Committee in all matters connected with the welfare of the Society.

10.—That in the absence of the Secretary from any meeting of the Society, minutes of the proceedings be taken by a member of the Committee, appointed by the President.

Treasurer.

11.—That the duties of the Treasurer be to collect all sums of money due to the Society; to receive all donations of money; and to disburse all sums payable by the Society out of the funds entrusted to him.

12.—That the Treasurer furnish half-yearly a detailed account of the receipts and disbursements to be audited by the Committee.

13.—That the funds of the Society be placed in the College Bank, and that no money be withdrawn by the Treasurer without the signature of the President to the order; or in his absence, that of the Secretary.

Librarian.

14.—That the duties of the Librarian be to keep a catalogue of the Library, with the names of the Donors; to see that the Library Regulations are carried into effect; to be responsible for the order of the Museum, and when necessary to assist the Secretary in the distribution of the Reports of the Society.

Library.

15.—That any Member of the Society be at liberty to consult any of the books belonging to the Society, but that only certain volumes, to be decided on by the Committee, be allowed to be taken from the room.

16.—That if any Member wishes to take a volume from the Museum, he shall give his name, and the name of the book, to the Librarian, who shall enter them in the book kept for the purpose.

17.—That every volume so taken out be returned by the end of the quarter, but that no book be kept more than one month.

18.—That if any volume be damaged, such damage shall be reported by the Librarian to the Committee, who shall decide upon any further proceeding in the matter.

Museum.

19.—That any Member of a section, who is not a Member of the Society, be allowed access to the Museum at such times as it is open to Members of the Society generally, provided he first obtain leave from the President, which leave shall be renewed every quarter, but may be taken away at any time, if the privileges be abused in any manner.

20.—That the same privileges be extended, under the same conditions, to such other Members of the School who may wish to use the Library and Collections for the purposes of study, provided there be a reasonable excuse for their not belonging to a section.

21.—That in all cases the Museum be used for the study of Natural History alone, and not as an ordinary Reading Room.

Members.

22.—That the election of new Members rest entirely with the Committee.

23.—That every Member pay a half-yearly subscription of 2*s.* 6*d.*, to be paid at the first meeting of the Society in that half-year.

24.—That if a Member be elected at, or after the Quarter, he shall only pay 1*s.* on Election.

25.—That Members have the right to be present, to state their opinions, and to vote at all general meetings of the Society; to introduce a visitor at general meetings of the Society; to have personal access to, and to introduce a visitor to the Museum; and to have a copy of the Report half-yearly.

Visitors.

26.—That on such occasions when the number of those who wish to be present as visitors at the general meetings of the Society is greater than the number of members who attend, the President and Committee shall be empowered to admit two or more each, as shall seem fit.

Honorary Members.

27.—That Honorary Members have all the privileges of Members, except the power of introducing a member of the School to the meetings of the Society.

Suspension of Members.

28.—That any Member be liable to be excluded from the Society by the Committee, if, in their opinion, he shall have failed to show sufficient energy in the working of the Society.

Sections.

29.—That sections be formed for the more accurate study of the different branches of Natural History, and that the Heads of these sections be chosen by the Committee half-yearly from Members of the Society.

30.—That these sections shall hold meetings as often as shall seem fit to the Heads of the several sections, at which any member of the School, with the sanction of the Head of that section may attend.

Meetings.

31.—That ordinary meetings of the Society be held once a fortnight, but that the Secretary be empowered to call extraordinary meetings when necessary.

New Rules.

32.—That any Member of the Society have power to propose any new rule or any alteration in an old one, provided the motion be seconded by another Member.

MEETING HELD FEBRUARY 15TH, 1867.

Ornithology.

G. H. DAWSON exhibited a Lapwing, which he presented to the Society.

E. IM THURN exhibited a Thrush's nest, containing the young birds stuffed, and also a Heron.

THE PRESIDENT then explained the theory of Dr. Baldanus, relative to the colouring of Cuckoo's eggs.

Entomology.

F. J. H. JENKINSON mentioned a few captures which had been already made : *Vanessa urticæ, Gonepteryx Rhamni, Hibernia Rupicapraria.*

Botany.

THE PRESIDENT read a list of the more important notices.

Archæology.

E. ALMACK exhibited some coins, a farthing of the reign of Queen Anne, shillings of Elizabeth, James I, Charles I, Edward VI, &c.

J. W. PARRINGTON exhibited some Roman and Saxon remains from the Sussex Downs, among them a spear-head made from the bone of a horse's leg, a bottle for the ashes of the heart, a bottle for tears, a granite celt, &c.

H. M. HILTON then read a paper on BEARS.

G. H. Dawson was elected a Member of the Committee, in place of C. A. Harrison.

There were 43 persons present.

MEETING HELD MARCH 1ST, 1867.

Ornithology.

G. H. DAWSON mentioned notices of the Woodcock (seen February 23rd) and Brambling (March 1st) and exhibited a Kingfisher, which he presented to the Society.

E. IM THURN exhibited a Wren's nest, built this year, but deserted on Feb. 23rd (known by the name of a cock's nest), and specimens of the four species of British Woodpecker.

A. HERKLOTS exhibited a specimen of the Tree Creeper.

J. W. PARRINGTON exhibited a Stormy Petrel, which he presented to the Society.

Entomology.

F. J. H. JENKINSON read a short list of captures made during the past fortnight.

Botany.

THE PRESIDENT exhibited all the plants as yet found in flower (upwards of 30 in number), several of which were a month before their usual time.

Zoology.

A. C. HILTON exhibited a mummified cat.

Mineralogy.

H. M. HILTON exhibited a fine specimen of Iron Pyrites.

Geology.

W. D. SMITH exhibited a very fine specimen of *Cardita planicosta*, found at Fyfield.

THE PRESIDENT mentioned that Sergeant Haggis had presented to the Society a matchlock, which he had taken from the Sikhs.

T. R. DUMERGUE then read the following paper on

PRESHUTE AND ITS ANTIQUITIES.

After considerable hesitation, I have fixed upon Preshute for the subject of my paper, my reasons being (i) that it is desirable to read upon some subject with which we are all connected, and of which we all know enough beforehand to appreciate any additional information which may be given upon it; (ii) that the subject about which we should be *most* interested, and with which we are *most* connected, has already been written upon, and Dr. Cotton's lecture on the Antiquities of Marlborough College is accessible to us all, and those of us who have not yet read it will, if they do so, I am sure, find themselves well repaid for their trouble. I have attempted, therefore, to write upon a subject bordering indeed upon, but not identical with the subject last named. I hope I shall not appear to be intruding too far upon another person's ground if I happen to relate here and there some of the same facts which are to be found related in Dr. Cotton's lecture; such an intrusion could hardly be avoided by anyone who has to write an archæological paper upon this district.

We are all of us, as I have already said, most closely connected with Preshute, so long as we remain in Marlborough College. We go to Chapel, we have our meals, we play cricket and football, we bathe, not in Marlborough but in Preshute, and one half of our number sleeps in Preshute every night. The College therefore might just as well be called Preshute College as Marlborough College as far as its site is concerned.

If you wish to know the limits of Preshute you must imagine a line drawn from the "lower ground" in the cricket field to the left-hand pipe which conveys the water from the roof in front of the Old House. Continue this line to the river, and let it run along the river to the E. end of the town. All the land immediately on the W. and S. of this line is in Preshute; the Railway Station and St. Margaret's are in Preshute, not in Marlborough. On the N. of Marlborough Preshute extends as far eastward as Mildenhall, and as far northwards as Ogbourne St. Andrew. It also extends as far W. as Fifield, and as far S. as Clench Common, which district it formerly included. It was once the largest Parish in Wiltshire. In area it is several times larger than the two combined parishes of Marlborough, but in importance it is of course utterly inferior to them. Marlborough probably once formed a part of Preshute, or rather what is now Marlborough was once Preshute, but as the former place gradually increased it formed itself into two distinct parishes; it cut for itself a hole, so to speak, in its neighbour's property, and there it has planted itself, and has grown so much in size and importance as to have long since ceased to be the rival of its unaspiring neighbour.

The origin of the town of Marlborough was due to the following causes. That which we now call the College Mound was in all probability raised, like Silbury Hill, by the so-called Druids, but soon after the Conquest it formed the foundation of the keep of a Castle, for which purpose it was admirably adapted. The name of this Castle was "Merleberg," which some persons suppose to mean the *hill* or *castle of Merlin* (Merlin was a British hero, and to him has been ascribed the building of Stonehenge); others take the first syllable to mean "marble" (a name given in consequence to the number of sarsen stones or grey wethers in this neighbourhood); others take Marl to mean the mineral substance which goes by that name, in consequence of the chalk formation of the district. It was usual in those times of warfare and oppression for the poorer inhabitants to resort to the neighbourhood of the castles of the rich, partly because they were their serfs, and were required to be near them in order to work on their estates, partly that they might obtain protection against marauders. In this way the town of Marlborough was originated.

I shall now attempt to put before you the history of Preshute as well as I can.

A few years ago there were no less than three substantial monuments of the Druids in this parish. One of these, no longer existing, was a cromlech which used to stand on the downs not far from Rockley; it was blown up (as I learnt one day when I had gone in search of it) by a farmer, because it got in the way of his plough. The other two still remain; one is the Cromlech or Kistvaen in Clatford bottom, commonly nick-named the "Devil's Den," which

is supposed to have borne some connection with the temple of Abury, which is not far distant, and which was erected either for sacrificial or for sepulchral purposes. Its form you all know, so it is needless for me to describe it. The third of these monuments is that object of which we may all feel proud, as it stands within our College grounds. The Mound is, as I have already said, supposed to have been erected by Druids; it must at all events have been standing long before the castle was built upon it, as it could not have supported it had it been otherwise. This mound perhaps had some connection with Silbury hill, both of these being on the banks of the Kennett, and both of nearly the same immense size. The whole neighbourhood indeed abounds with the monuments of early Britons, in the form of tumuli.

Passing on from early times to the period of the Romans in Britain, we have two specimens at least of Roman work in this parish. One is the Bath Road, for the present road for the most part follows the same track as the old Roman road from London to Bath; that part of it, however, which passes by our gates is not Roman; the original road at this point was much more direct than the present one, and passed close in front of the present Old House. The other piece of Roman work to which I allude is a small rectangular camp, situated at the extreme S. of the Common; you pass it on your right as soon as you leave Kingsbury street on your way to Rockley. There has been much dispute as to the claims which this enclosure may lay to antiquity; several persons think that it is only a work of modern times. It may, however, have been used as a small out-post of the neighbouring station, Cunetio. This station, I may observe, is mentioned in the account of Antonine's march from Bath to London, as having been chosen by him as a hâlting place. The opinion of antiquarians once was that the Castle Inn, *alias* Marlborough College, was the site of this ancient station, but it has now been found to be far more probable that Cunetio stood where Mildenhall now stands, or else about a mile S. of Mildenhall, at a place called Folly Farm.

The only monument of the Saxons in this locality I believe to be the Wansdyke *(Woden's Dyke)*, which you may see in the West Woods, and again close by the fir-trees on the way to Martinsell. This enormous work seems to have been raised to mark the division between the two kingdoms of Mercia and Wessex. It seems to have extended from the Thames to the Severn, thus dividing the island into two portions. You may see it in great perfection if you choose to go to St. Ann's Hill, where the rampart cannot be less than 20 feet high, and the moat is of about an equal depth. Some persons believe this to have existed even before the Roman period, because at Morgan's Hill, the Roman road meets it, and even runs in the moat for some distance.

I shall now pass on to the Norman period. We do not know the date of the foundation of the Castle, nor yet the name of the founder. We do know,

however, that William the Conqueror imprisoned Agelricus, Bishop of Southsex or Sussex, within it; as early therefore as William I.'s time Preshute may have received its Norman name, which is derived most likely from *Près-de-Château*—"near the Castle," or *Prés-de-Château*—"the meadows of the Castle." A most unlikely and absurd derivation has been given by one who imagined the name Prestcut, as it was once spelt, to be a corruption of Priest's cote. Stukeley was of opinion that the name had been given in consequence of the low meadows in which the Church stands, but this explanation seems too vague, and I have not been able to understand what the connection is between "Preshute" and "low meadows." The two first explanations seem to be by far the most satisfactory, for what could be more natural than that the land immediately surrounding the Castle should receive its name from it.

Having said thus much upon the name of Preshute, I shall now pass on to the history of the place. The Doomsday Book does not tell us directly in whose keeping Marlborough Castle was, at the time in which the book was compiled, but Manton or Preshute was held, as that book informs us, by a man named Miles Crispin, who also held Ogbourne.

The next notice that we have of Marlborough Castle is that Henry I. held his court there at Easter, 1110. During his reign a priory was built at Clatford, which is in Preshute parish, and lies between Manton and Fifield. The founder is a certain Ralph de Mortimer, and the priory was built in connection with the abbey of St. Victor en Caux, in Normandy. On the site of the priory there is now a large farm-house. We are told that in the reign of Henry IV. a man named Woodford, of Marlborough, was convicted of having stolen a stone, of the value of 40d., which had been placed in front of the high altar of this priory.

After Henry I.'s death, not only Marlborough, but almost the whole county became the scene of the contest for the crown between Stephen de Blois and Henry I.'s daughter, Matilda. During this period the castle was held by John Fitz-Gilbert, a robber chieftain, who is accused by a contemporary historian of having been guilty of every kind of crime. He was one of Matilda's supporters, and he showed his boldness and ferocity by hanging the keeper of Devizes Castle, who was devoted to Stephen, upon gallows which he erected before his victims castle walls. I must not, however, say too much about Marlborough Castle, for you had better read Dr. Cotton's lecture if you wish for information about that. But I cannot well avoid saying a few words with reference to it as I proceed, for, as is most natural, the history of the Castle forms so important an element in the history of Preshute.

We have but few notices of this neighbourhood in Henry II.'s reign. A preceptory was built at this period on the site of the present house at Rockley by some Knights Templars. Henry II. granted the Castle, soon after his

accession, to his son John, who often came to Marlborough. We read the following interesting fact connected with Preshute from the rolls: "The King to all men greeting. Know that by divine intuition, and for the safety of our soul and the souls of our predecessors and successors, we have given unto Eve, the recluse of Preshute, the sum of one denarium *(penny)* per diem, which she shall enjoy in free gift so long as she lives, to be doled to her by the hands of the constable of Marlborough Castle. Dated at Ludgershall, 4 Aug. 1215." This I believe to be the oldest notice of anything of a religious nature in Preshute itself, though religious houses had already, as we have seen, been erected in the neighbourhood. Yet there must have been a Church at Preshute even at this time, and I will tell you by and bye my reasons for making this conclusion. Soon after king John's reign, at all events, and perhaps during his reign, Preshute possessed, if not a church, at least a chapel. The Chapel of St. Nicholas was situated in the Castle ground, close under the mound; its exact site is unknown. It is mentioned as a fabric as early as 1249, but the first institution to it is dated 1311. It was called the "Free Chapel" of St. Nicholas. This institution may well afford special interest to anyone connected with Preshute, for it was within its walls, in all probability, that the fine old font now in Preshute Church stood when some King John's children were baptised at it. Some persons believe that King John himself was baptised at it, but we do not know for certain whether the Chapel had been built until after his death; yet it is possible that even if it had not been built until 1249, the font may have existed in the Norman church of Preshute. I have put before you a sketch of this font; you may see the object itself just inside the door of Preshute Church. There have been many different opinions as to the material of which it is composed. It certainly *appears* to be black marble, but some persons say that it is touchstone, others black agate, others dark grey marble, others slate. Not many years ago it was taken to Devizes to be repaired, for it had been very much broken; the general belief as to its material was I believe that it was of black marble. Some persons consider it to be a Norman work, but an examination of any Norman font, such as that at Winchester or at Avebury, will immediately show how unlikely this is. It may have come from the continent.

Let us once more follow the history of the place. Henry III often used to visit Marlborough. In his reign several additions and improvements were made to the Castle. Most of you must have seen a moderately large, gabled house, very old and very picturesque, on your way to or from Marlborough Railway Station. It is the last house which you pass, on your right hand after crossing the bridge at the further end of the town, before you reach the Station. This was formerly a flourishing Priory of White Canons of the Sempringham Order, dedicated to St. Margaret. Henry III. is mentioned as

having given to it all the land in La Berton (*Barton*). The monks who lived here seem to have been very well-to-do, as they derived a good revenue from almost all the principal parishes in the neighbourhood. To this institution Richard II. annexed a hospital dedicated to Thomas à Becket, which had been built in Henry III.'s reign. It was established for the maintenance of a master and several poor sick brethren. At the time of the suppression of the monasteries by Henry VIII., St. Margaret's became a private house. We are told that soon after it had become so "One Master Daniel" lived there, and while it was in his possession it became celebrated by the death of James I.'s Prime Minister, Sir Robert Cecil, which is said to have taken place there A.D. 1612. This man had been created Viscount Cranborne and Earl of Salisbury, and though he was a prudent member of James I.'s Council, yet he was not without the same mistaken ideas which Strafford showed with respect to the unlimited power of the king's prerogative.

From the time of Henry III, the Castle began to assume more of the appearance of a country mansion than it had done previously. It remained in possession of the Crown until Henry VIII's reign, when it was changed into a manor house. Leland informs us, writing in 1538, that "By the Chief Parish Church dedicate to St. Peter, there is the ruin of a great Castle, hard by the West-end of the town, whereof the Donjon tower partly yet standeth." The Castle passed from Catherine Parr through her second husband to her husband's brother, Edward, Duke of Somerset, the Protector during Edward VI's minority, and the son of Sir John Seymour, whose handsome tomb you may see at Great Bedwyn. The family of the Seymours', some of whom bore the title of Duke of Somerset, others that of Earl of Hertford, continued in possession of the Old House till the middle of the 18th Century, at the end of which period it became an Inn, and in 1843 it was transformed into Marlborough College.

The Castle must have been dismantled early in the 16th Century, for there are no institutions of the Chapel of St. Nicholas bearing a later date than 1517. The present building—the Old House—was built by Francis Lord Seymour, the great grandson of the protector Somerset, and was designed, it is said, by Inigo Jones. The parish register of Preshute records the death of some of the workmen who were accidentally killed while building it.

Now that I have touched upon the subject of the Preshute registers, I may as well observe that the earliest of them extant is dated 1607, and that in that same century a record is made of the baptisms of three of the Seymour family, two of whom became Dukes of Somerset, being sons of Charles, second Lord Trowbridge, and grandsons of the builder of C. House. One of them was Francis, who was murdered in Italy, the other was Charles, who, by succeeding his brother in the title became the sixth duke. The

character of the latter brought upon him the name of the "Proud Duke of Somerset." In the next century two sons of Francis Seymour were interred at Preshute.

I have not time, I fear, to give an account of the two sieges of Marlborough which took place soon after the Civil War; all this neighbourhood was, of course, affected by them.

There are a few miscellaneous pieces of information which I should like to give, with respect to Preshute.

First, I shall try to put before you the meaning of the word *Barton*, which is the name of the district to the N.W. of Marlborough, after which the new Masters' houses and Mr. Lyne's farm are named. One opinion is that Barton means a court-yard or enclosure near a manor, being derived from the Saxon *beretun*, *bere* meaning 'barley' and *tun* an 'enclosure, 'Rick-barton' being a synonym for 'Rick-yard;' thus the name would naturally date from a time a manor has existed in the neighbourhood: that this manor cannot have been the present Old House is evident from the name la Berton being applied to this locality so early as Henry III's reign; I have not had access to the copy of the Doomsday Book or to any early MSS. which would give a list of all the manors in this district in early times, otherwise I might have been able to speak with more certainty on this point.

I cannot myself therefore but incline to the other opinion on the subject, namely, that *bar* means the 'bar gate' of the castle, and *town* is used with the Scotch signification and means 'a farm enclosure;' if this latter be the correct explanation, Barton is one of the few names still in existence which remind us of the Castle, the other names which do so being Preshute, Merleberg (or Marlborough), and a third, which I have not yet mentioned, but which was given to a quarter of the town in later times, Bailey Ward.

The meaning of the word Manton I have not quite discovered; it occurs in the Doomsday Book.

In the village bearing this name are preserved two specimens of the carriage which was used 150 years ago. One is a four-wheeled carriage, the other a phæton; both appear to have been very handsome in their day. They were built for one of the Baskerville family on his becoming high sheriff of Wilts, and they bear his coat of arms upon their panels. The Baskervilles are of royal blood; they claim descent, as Mr. Waylen informs us, from several kings of Western Europe, and even from Charlemagne himself. They formerly lived at Rockley, and their names appear several times in the Preshute parish registers.

In the vestry of the church there is a hatchment probably belonging to one of the Beach family, which was one of the leading families in this district in former times, and of which no trace remains here at present. There is also

a monument recording the deaths of two members of Parliament, a father and a son, named Daniel. This name occurs on the Roll of Battle Abbey as borne by one of the companions in arms of William the Conqueror. This particular branch of the family bought St. Margaret's priory soon after the suppression of religious houses by Henry VIII. The benefice of Preshute in early times was of great value, nor is it inconsiderable at the present time, but the great tithes are appropriated by the lay vicars of Salisbury, and the Vicar of Preshute receives his tithes from Clatford only. The Chapel of St. Nicholas was originally in the gift of the Vicar of Preshute, but afterwards it was, as the Church of Preshute now is, in the gift of the Bishop of Salisbury. A M.S. dated 1291, gives us the following information:—"Ecclesia de Prescut cum Capella, taxatio £20, decima £2." Preshute Vicarage was burnt down during the last century, and has never been rebuilt. It used to stand at the top of the churchyard, on the side of the pathway to Manton, opposite the present Preshute House. Its site is still marked by some elm-trees, which, together with the hedge which bounds the field by the churchyard, enclose a rectangular space, which was formerly the vicarage garden. Dr. Stukely mentions in his Itinerarium that in his time the church contained a piece of glass in one of the windows upon which was inscribed, DNS. RICHARDUS HIC VICARIUS, who he believed, "lived formerly in a little house at Marlboro' over against the castle [inn], now an ale-house, where his name is cut in the same old letters over the door." It seems, therefore, that either the "Mount Inn" or the "Coach and Horses" was formerly used as Preshute Parsonage.

Whether it is really true that Thompson the poet composed his "Spring" at Preshute I cannot say; a stone at any rate used to be pointed out not long ago upon Granham Hill, upon which, it is said, he used to sit while he meditated upon his verses.

The rest of my paper will be devoted to a short account of the church. The nave, aisles, and chancel were rebuilt in 1853, much after the model of the old building; the pillars in the interior are Norman, with the exception of the semi-pillar attached to the eastern wall of the south aisle, which, though it bears a Norman moulding, is of modern construction. These pillars were taken down at the restoration of the Church, were scraped and cleaned, and then put together in the same state as they had been previously. I must take it for granted that you are all aware how in England the Norman style is the earliest style of church-building, of which this country possesses any variety of specimens, and how this style passed gradually away, and was followed by the Early English style; how that then, after a transition, came the Decorated; another transition then followed, and lastly the perpendicular style was used. When you know this you can readily understand, I think,

what I have to say with regard to the construction of the Church. That there was once a Norman Church at Preshute seems certain, for before the restoration in 1853 there was a low Norman arch separating the chancel from the nave; and besides this a piece of Norman carving was found upon the inner flat surface of a semicircular block of stone which had been used in the construction of one of the Norman pillars; another proof appears in the existence of these pillars themselves, which are genuine Norman, and (with one exception) are not merely modern imitations.

The remainder of the older part of the Church was built, as we judge from the peculiarities of its architecture, during the transition from the Decorated to the Perpendicular style, *i.e.*, in Edward III.'s or Richard II's reign. The chief proofs of this are the west window (in the tower) and the east window of the chancel, which, though new, is an exact representation of the old east window. The former of these, from the rudeness of its construction, gives evidence of having been built before that style had been quite understood by the builders; the latter is an example of the florid or flowing tracery (peculiar to the Decorated style), in which there is a slight tendency towards the Perpendicular, some parts of the tracery being a little elongated, forming almost straight vertical lines, which is the main characteristic of the Perpendicular style. The architect who restored the Church has, I think, very successfully shown the transition from the one to the other style in the three smaller windows of the S. aisle.

The tower is a specimen of the Early Perpendicular style also; on either side of the western window there is a small shield bearing some of the usual emblems of our Lord.

I may remark that the pews are all made out of the oak fittings of Malmsbury Abbey. There is one brass in the Church, dated 1518, from which I have taken the rubbing which you see. The inscription is—

pray for the soules of iohn Bailey & maryon his wyf, whiche iohn deceffed the ix day of may the yere of our lord god mvcxviii on whose soules ihu have mercy.

It represents the venerable John Bailey and his wife Marion, beneath the former are arranged their three daughters and beneath the latter their seven sons, all of them being in an attitude of deep devotion, each standing in exactly the same posture as those on either side, as though the drilling of the 16th century was as perfect as the Egyptian and Assyrian sculptures represent that of the ancients to have been.

In the porch there is preserved a very elegant piscina in the form of a flower, four shallow circular bowls forming the four petals, with a sort of finial in the centre, and each bowl has its own drain.

The piscina is now built vertically into the wall of the porch, outside the church door. There are one or two fragments of ancient carving preserved in different parts of the church, of which one is a quatrefoil, under the east window, another is a representation probably of some saint holding a sword in his hand, perhaps St. Paul; it is just possible however that it may be intended to represent St. George, the patron saint of the Church, though that is not likely.

The one object, however, of which Preshute Church may well be proud, is the font, which, though exceedingly interesting from its history and associations, is not the less so on account of its merits, its great age, its large size, and its imposing form.

I have now said all that I have thought necessary upon this subject. Let me only add that whatever information I may have given about the castle I have not borrowed from the lecture delivered by Dr. Cotton, for that would hardly have been right, but I have gone one step farther back, and whatever I have thought necessary to say upon this subject with reference to the castle I have derived from Waylen's History of Marlborough. I am indebted to the Vicar of Preshute also for much of my information upon the subject.

You see that there is nothing in Preshute which can make it *famous*; it has indeed some few interesting associations, but its greatness is still yet to come, and let us hope that it is wrapped up in the future, not only of Preshute House, but also of that institution to which Preshute House belongs —our School.

W. D. SMITH was elected head of the Geological Section: and C. M. Bull, Esq., and Rev. H. Bell, Honorary Members.

There were 46 persons present.

MEETING HELD MARCH 15TH, 1867.

Ornithology.

THE PRESIDENT presented to the Society a Pintail Duck, a Ruff, and Reeve.

E. IM THURN presented a pair of Partridges.

Archæology.

T. R. DUMERGUE exhibited some coins, among which were a coin of the reign of Shanghai, a denarius of Trajan, and Constantine.

THE PRESIDENT exhibited a scent bottle taken from an Etruscan tomb.

Geology.

A perfect collection of crag fossils, presented to the Society by the Rev. F. W. F. Farrar, F.R.S., was passed round.

E. ALMACK exhibited a specimen of Portland marble.

THE LIBRARIAN mentioned that the Rev. H. E. Booth had presented Linnæus' "Systema Naturæ" to the Library.

DR. FERGUS then gave a lecture, illustrated by numerous diagrams and preparations, on "The Human Eye."

There were 36 persons present.

MEETING HELD MARCH 29TH, 1867.

Ornithology.

G. H. DAWSON exhibited eggs of the Tawny Owl and Rook, taken this year in the Forest, and mentioned notices of the Kingfisher and Snipe.

E. IM THURN exhibited specimens of the four species of Owls found in the neighbourhood.

J. W. PARRINGTON presented a Nuthatch to the society.

Botany.

THE PRESIDENT exhibited specimens of all the wild flowers as yet in bloom.

Geology.

W. D. SMITH exhibited a spine of a *Cidaris* found in the chalk on the London road.

Archæology.

T. R. DUMERGUE gave a short description of the different Tumuli in the neighbourhood.

THE PRESIDENT exhibited a Bronze Roman Lamp, and one of earthenware from Poszuoli, and a small Etruscan vase from Cumæ.

THE PRESIDENT read a paper, written by J. W. MILLS, on "The Trades of Animals."

P. G. YOUNG was elected a member.

There were 47 persons present.

MEETING HELD APRIL 12TH, 1867.

Ornithology.

G. H. DAWSON gave his Report.

E. IM THURN presented specimens of the common Gull and Rook to the Society's collection.

THE PRESIDENT presented a pair of Magpies.

Entomology.

F. J. H. JENKINSON gave his Report.

THE PRESIDENT exhibited a Pupa of the Death's Head Moth, which still retained the head of the Caterpillar.

Zoology.

THE PRESIDENT presented a variety of the water-rat.

Geology.

W. D. SMITH exhibited specimens of *Cardium dissimile*, Fossil-wood, and Ammonite, from the Portland beds at Swindon.

J. B. OAKELEY exhibited some fossils found near Monmouth.

Botany.

THE PRESIDENT read a list of notices, and exhibited a species of Corydal *(C. tuberosa)* new to the County, found in the West Woods, as well as a specimen of *Xylaria Hypoxylon*, a Fungus not often found in the neighbourhood.

Archæology.

J. C. PALMER exhibited a Burmese book, written on Palm leaves.

G. H. DAWSON then read the following paper on

EAGLES AND HAWKS.

In speaking of Eagles I shall confine myself to the two which only can strictly be called British Eagles, and which are at all common in this country, namely, the Golden and the White-tailed Eagle. When I say common, you must remember that it is now an unusual thing to see an Eagle anywhere south of the Border, and they are now becoming rare in the lowlands of Scotland. I shall begin, then, at once with the Golden Eagle, which may well be called the king of the feathered tribes. The geographical distribution of this bird is very extensive; it is found in the northern parts of Africa and America, in Russia, Norway, Sweden, the Pyrenees, and the Alps. By the native Indians it is held, as it is by almost every other people, to be an emblem of might and courage, and the young Indian warrior glories in his Eagle plume as the most honorable ornament with which he can adorn himself. The feathers of the Eagle are attached to the calumets or smoking-pipes used by the Indians in their solemn festivals. So highly are these ornaments prized that a warrior will often exchange a valuable horse for the tail feathers of a single Eagle.

In Britain it is far most frequently found in the highlands of Scotland. In size it measures 3 feet in length, and the wings of an adult bird when expanded reach to the extent of 7 feet: the weight of an old bird is about 12 lbs. It may be distinguished from the white-tailed Eagle not only by the different

colour of its plumage but also from the fact that its legs are feathered to the toes, as you must have noticed in the bird which we now have. Its nest is placed on a high and frequently inaccessible precipice, where it forms a solid platform of several feet in width, built of sticks and branches of trees interlaced with smaller twigs, and covered with layers of reed or heath. The female seldom lays more than 3 eggs, of a dirty white colour spotted with red.

Its food consists chiefly of animals taken alive; scarcely even when very hungry is it known to touch any carrion, in its free state. This statement I must not give as a certainty, for I find that many naturalists are inclined to the opposite opinion. One person declares that he has seen as many as nine Eagles together on the carcase of a dead animal. Sir Walter Scott was evidently of the latter opinion, from the lines in the Lady of the Lake:—

"That Highland Eagle e'er should feed
On thy fleet limbs my matchless steed."

Lambs, fawns, and birds of various kinds form their usual prey; there are several instances on record of their having carried off young children, but I cannot find any very satisfactory proof of this. These birds are said frequently to attain to a very great age; one is said to have died at Vienna in 1719 which had been kept in confinement there for more than a century; but here again I cannot positively vouch for the truth of the statement. The fierceness of this eagle may be subdued in many instances, though it is said to be generally more ferocious than the white-tailed eagle. Thus, for instance, one was taken in the forest at Fontainbleau, in a trap set for foxes, the spring of which broke his claw: his cure was tedious, and attended with a painful operation, which however was borne with the greatest patience. During the operation his head alone was at liberty, but he did not avail himself of this to oppose the dressing of the wound from which several splinters were taken: being then laid on his side, he passed the whole night without motion, and the next day he stood for twelve hours without once resting on his unsound foot. The patience which he showed throughout was so great that his wound was finally perfectly cured. Here, as it seems to me, we have quite a sufficient proof that eagles are not by any means untameable. I find, moreover, mention made of eagles having been used in many places, in the same way as hawks, for taking large game such as deer; they have certainly been so used in Tartary, and it is believed they are employed for this purpose at the present day in Persia and some parts of India.

I have now to say a few words about the White-tailed eagle or Sea eagle as it is otherwise called. In size this bird does not differ materially from the one of which I have just spoken, though generally it is a little smaller; its plumage is of a dusky brown colour with the tail wholly white. As its name, the (Sea

Eagle) implies, it breeds chiefly on the sea coast, though it is occasionally found inland: its food consist of fish and of the young birds of gulls, &c. Its nest is made most frequently on the ledges of high rocks, though occasionally in large trees; it is often composed almost entirely of sea weed. When this bird is found at any distance from the sea it is generally in the neighbourhood of one of the inland lochs in Scotland. Its eggs are only two in number, of about the same size and shape as those of the goose: when first laid they are probably perfectly white, and the slight colour with which they are marked is only the result of stains. This eagle is frequently attacked by the Skua gulls, who on these occasions always collect in considerable numbers, and sometimes get the victory in these encounters. The gulls never venture to attack the enemy in front, but make short circles around him, and, with a desperate swoop from behind, strike him on the back, and then dart up again into the air almost perpendicularly; the eagle is not able to turn so easily as they can, and hardly knows how to resist the attack. The gulls will persevere in their cowardly attacks for a long time, until at length they put the eagle to an ignominious flight, when they themselves retire in triumph.

I hope I have been able to give you some little idea of these two kinds of eagles: the difference between them as you have seen is considerable both in their food as well as their habits, though the white-tailed eagle is not by any means particular in confining himself to such food as he gets on the sea coast. I did not intend giving you more than just a very short sketch of these birds, and from them I shall pass on to the hawks. I shall not give you a long account of all the different kinds of hawks (which I do not suppose would be of any great interest to most of you) though I shall have some little to say about each one of the family. I shall also tell you about hawking which may not be altogether uninteresting. The terms hawk and hawking are so familiar that it might appear unnecessary to enter into any explanation of them, but in reality they cannot be strictly applied to this whole family of birds, though they are now used indiscriminately when speaking of any member of it: the Goshawk and sparrow-hawk are the only two British types of the family of Hawks, strictly so called; the rest we should more accurately call Falcons: this distinction I think may be dropped by us now as it is when speaking of the subject generally.

As I wish to say a few words about each several member of the family, I must begin with the Ger Falcon otherwise called the Iceland Falcon, which properly heads the list, and was one of the most highly esteemed birds for the purpose of hawking. This bird may be considered the boldest, the most perfectly winged and, in proportion to its weight, the strongest both for action and endurance of all the feathered tribes. It breeds in great numbers in Iceland, as its name implies; thence it was frequently imported and used to fetch a very high price from its great use for hawking purposes.

The Peregrine Falcon comes next, which was also one of the most important agents in all falconry: a good deal of difficulty has often arisen about this bird from the frequent changes of plumage which it undergoes, at its different periods of life. This species is more common in Britain than the last mentioned; it has been known to breed in the Isle of Wight and is met with annually throughout the Scotch coasts. I find the following account of the daring shown by the peregrine falcon: A young bird of this species had been taken from its nest before it was able to fly, and consequently before it had been much accustomed to slaughtering its prey; being put in a room by itself, it was left for a whole day without food, its wings having been slightly clipped. At the end of the day an old male heron was introduced into the room where the falcon was at liberty, the tip of the heron's bill having been previously sawn off. The falcon took up its post on a stool, which stood at one end of the room, and kept its eye fixed on the heron as the latter traversed the apartment; at length judging the heron to be sufficiently near, she sprung at its head, intending to seize that part with her talons; in this, however, she failed, from the stool not giving her sufficient elevation to make the spring without much assistance from her wings, and the heron dealt a blow with its bill which would have been fatal had the bill been perfect. The same manœuvre was repeated by the falcon several times with equal want of success. At length she managed to establish herself on a box which stood at the opposite end of the room, and supplied a more elevated perch: by this means she could get the required impetus, and suddenly springing from the perch seized the unfortunate heron by the head, and made short work with him in spite of his attempted resistance on the ground. This seems to me a good instance of the daring shown by these birds, since in this case the hawk was a young one and had had no previous practice in encounters of the kind.

We next come to some of the smaller hawks, as the Hobby, which is now rare throughout England; it is inferior in courage to none of the family, and has been frequently known to take birds as large as partridges: it was highly esteemed by some of the most reputed of the old falconers, though chiefly for taking small birds, such as larks—and was also used for the purpose of frightening partridges so as to prevent them from rising, when they might be shot with the cross-bow.

Next is the Kestrel, which is one of the most common of our hawks: these are the birds which we so often notice hovering for a long time in one place, and hence its name of the "windhover hawk," by which it is known in some districts. Beetles form a part of the food of this hawk, a peculiarity shared by none of the others: some naturalists have even asserted that it kills no birds of any kind, but this seems to be a mistake. It is said to have been occasionally used in hawking for partridges and other birds of straight flight, but was probably of no great use to the falconer.

From it we pass to the Merlin, the smallest of the hawks, but at the same time the most active and beautiful. Not much larger than a blackbird, it has been known to kill a partridge at a single pounce, so great is its power and determination. Its prey consists chiefly of such birds as chaffinches, larks and thrushes; it is said to have been used in hawking for snipes, and to have afforded excellent sport of this particular kind; if this be really the case, we can imagine that it must be a bird of very swift flight indeed.

All the hawks of which I have as yet spoken are distinguished by having long wings, as opposed to the so-called short-winged hawks, about which I shall now say a few words. To these belong the Goshawk, the Sparrow-hawk, and the Buzzards; these are not able to soar aloft and thus reach their prey, or pounce down upon it from any great height, but take it by seizing it near the ground. The Sparrow-hawk is one of the commonest of our British species, though perhaps more shy and untractable than the kestrel. At times, however, it shows great boldness when in pursuit of its prey—one is known to have entered a room where a goldfinch was hung up in a cage, and to have remained there for some considerable time, as the owner on entering found the goldfinch already dead with its feathers plentifully scattered about. As to the strength of these birds it may be noticed when comparing them with eagles as regards their power of carrying great weights, that a sparrow-hawk was once seen to seize upon a weasel, an animal nearly its equal in size and weight, and actually mount aloft with it; it however paid for its rashness by receiving a mortal bite on the throat, whilst the weasel escaped without any serious injury.

The following also is a strong corroboration of the truth of the story just mentioned, and also illustrates the powers of the hawk in raising comparatively heavy weights; whilst it is more curious as displaying the courage shown by a timid animal in defence of its young. A gentleman in Yorkshire while walking in the fields saw a small hawk attempting to fly off with some prey it had just pounced upon, but evidently prevented by the weight of the animal from rising to any height from the ground. It was pursued by a hare, which, whenever it came within her reach, attacked it with her paw, and at last succeeded in knocking it down, when it dropped its prey. At this moment the gentleman ran forward and the hawk and its pursuer both made their retreat, and on reaching the spot he found a fine leveret which had suffered severely from the talons of the hawk. The sparrow-hawks seem to supply their young liberally with food. Mr. Selby mentions having found a nest of five young sparrow-hawks which contained besides them a lapwing, two blackbirds, one thrush, and two green linnets, recently killed, and partly divested of their feathers.

The Gos-hawk comes last on the list of those of which I wish to give you some little description: it is now rare in England, though formerly it was very plentiful and much valued for hawking. It committed great devastation among partridges; its mode of hunting was to beat a field and when a covey was sprung to fly after them and observe where they pitched, and then rise them a second time, until after a few times the partridges became so wearied that the hawk could secure one or more of them acocrding to its pleasure. It is not a very fast flyer, and therefore is unable to overtake the partridge at its first rising.

Having said so much of the different kinds of hawks, I will now try to give you some little idea of the sport of hawking, and also of the training, &c., of the hawks. I will first read you some selections from an account which I find given by an eye-witness of a day's hawking in 1825, in the county of Norfolk, not far from a heronry. From this you will have some idea of the sport in its modern form. The party assembled towards the afternoon, the wind blowing towards the heronry—there were four couple of hawks, all of them belonging to the breed of Peregrine Falcons. These were carried by a man to the ground upon an oblong kind of frame, padded with leather, on which the birds perched, and to which they were each fastened with a leather thong. On reaching the required spot the birds were taken off the frame and fastened to the ground in a shaded place suited for the purpose, with the exception of two which the falconers carried on their wrists, holding between their finger and thumb a small piece of leather attached to the legs of each of the birds. A heron now appeared, and was apparently coming within reach, when each of the men being now ready with a falcon on his fist, and the boy with the lure tied to his waist, and mounted on horseback, they proceeded slowly in the direction from whence the heron was flying; and as soon as the heron was nearly opposite, though at a very considerable height in the air, they slipped the hoods from off the heads of the falcons, holding them still by the bit of leather until they caught sight of the heron, when the sport commenced. The moment the birds were let loose they went off straight as arrows towards the heron, which by this time had gone a considerable distance ahead. As they were dashing away towards it an unfortunate crow happened to cross their path, when one of them instantly darted after him, but he contrived to escape by flying into a plantation, where the falcon followed but did not take him. The other falcon soon overtook the heron, which began to prepare for the attack by disgorging its ballast, consisting of two or three fish; while the hawk, after flying round for a short time in circles, at length soared above him, and, pouncing downwards, struck him on the back, when they both came tumbling down together from a great height to the ground. The second falcon, having lost some time in pursuing the crow, was now flying with all speed to

assist her companion, and was coming up just as the first falcon and the heron were falling. At this instant a rook happened to fly across, when the disappointed falcon struck at him, and they both fell together within 20 yards of the other pair. No sooner had they reached the ground than each of the falcons began to pull its victim to pieces, but as soon as the falconers could come up the lures were thrown out, consisting of pigeons, and the falcons having been kept fasting for some hours before were allowed to make a meal upon them. The account in the original is a good deal longer than this, but this is enough to show you something what the sport was like.

The origin of hawking is somewhat uncertain, it cannot be traced with any accuracy to an earlier period than the middle of the fourth century. It appears certain that the amusement was first discovered abroad, where it became fashionable some time before it was known at all in this country. The time of its introduction into England cannot be fixed with certainty: but about the middle of the eighth century Winifred or Boniface, Archbishop of Mayence, himself a native of England, presented to Ethelbert, king of Kent, a hawk and two falcons, and about the same time a king of the Mercians requested the same Boniface to send him two falcons which had been trained to kill cranes. In the succeeding century the sport was very highly esteemed by the Anglo-Saxon nobility, and the training and flying of hawks became one of the essentials in the education of a young man of rank. Alfred the Great is commended for his early proficiency in this as well as in other fashionable amusements, and he is even said to have written a treatise on the subject of hawking. It is plain that the amusement, even at this early time must have been very generally followed to call for the prohibition, inserted in a charter granted by one of the Mercian kings to the Abbey of Abington, which forbade all people to carry hawks and thereby trespass on the lands of the monks who resided therein. About the eighth and ninth centuries we are told that the Grand Falconer of France was an officer of great eminence—his annual salary being 4000 florins: he was attended by fifty gentlemen and fifty assistant falconers, and was allowed to keep 300 hawks. He had the right of granting licences to every vendor of hawks in France, and received a tax upon every bird sold in that kingdom. In Doomsday Book a hawk's breeding place (*Aira accipitris* as it is in the original) is returned among the most valuable articles of property, which proves the high estimation in which these birds were held under the early Norman kings, and probably some establishment like that mentioned above was made for the royal Falconer in England. We must notice that the ladies not only accompanied the gentlemen in pursuit of this amusement, but even practised it by themselves; according to a writer of the 13th century they even excelled the men in knowledge and exercise of the art of Falconry, which

reason he ungallantly produces to prove that the amusement was frivolous and effeminate. Hawking was forbidden to the clergy by the canons of the Church, but the prohibition was by no means sufficient to restrain even them from the pursuit of this favourite amusement.

The practice of hawking declined as might be expected from the moment that the musket was brought to perfection at which time the immense expense attending the training and keeping of hawks became altogether unnecessary. Its fall was very rapid; at the commencement of the 17th century it seems to have been in the height of its glory; at the close of the same century the sport was rarely practised, and a few years afterwards was scarcely known at all.

As to the method of hawking in ancient times, it was performed either on horseback or on foot as occasion required—on foot chiefly when the sport lay in covers. In following the hawk on foot it was customary for the sportsman to have a stout pole with him to assist him in leaping over small ditches, &c., which might prevent him in his progress. This we learn from a fact related by an historian of the name of Hall, who informs us that Henry VIII, while pursuing his hawk on foot attempted with the help of his pole to leap over a ditch half full of muddy water: the pole broke and the king fell head foremost into the mud, where he would have been stifled, had not a footman, one John Moody, who was near at hand and saw the accident, leaped into the ditch and released his majesty from his perilous situation.

There were a great number of laws respecting hawks and hawking, passed at different times; under the Norman kings, none but the nobles were allowed to keep hawks. In the 34th year of the reign of Edward III, a statute was made by which a person finding a hawk of any kind that had been lost by its owner was enjoined to carry it to the Sheriff of his county, who had to make proclamation of the same through all the principal towns of that county. If the person finding the hawk concealed the same, he was liable on discovery, to pay the price of the bird, and to suffer two years' imprisonment, or more in default of payment. In the 37th year of the same reign this enactment was confirmed with still greater severity, and the stealing or concealing a hawk was made an act of felony: in the same reign moreover the Bishop of Ely excommunicated certain persons for stealing a hawk that was sitting upon the perch in the cloisters of Bermondsey in Southwark; but this piece of sacrilege was committed during divine service, and the bird was the property of the bishop himself. During the reign of Henry VII, it was decreed that if any person was convicted of taking from the nests or destroying the eggs of almost any kind of hawk, he should suffer imprisonment for one year and one day, and be liable to a fine at the king's pleasure; he was equally subject to the penalty even if he

destroyed the eggs on his own land. The severity of these laws may perhaps surprise you until you have heard how highly these birds were formerly appreciated. At the commencement of the 17th century a Gos-hawk was sold for 100 marks, a large sum in those days. In the eighth year of the reign of Edward III, the king of Scotland sent him a falcon as a present, which he not only graciously received, but rewarded the falconer who brought it with a present of forty shillings. It is further said that in the reign of James I, a certain gentleman gave £1000 for a cast of hawks—a cast of hawks according to an old book on the subject signifies two, and a *lese*, I suppose the same as leash, three. It certainly seems strange to us to hear of hawks as so very valuable when we now see them persecuted more than almost any other bird by every gamekeeper in the country.

Having given some idea of the value of a well-trained hawk, I will now give you a very few words on the process of training them. The young birds on being taken from the nest, or perhaps caught when just able to fly, were taken home with great care and a hood or cap placed over the eyes of each bird, and then it was left to itself for a day or two. After this it was quietly placed on the fist, carried up and down for nearly a whole day, and gently stroked with a feather. Having been in some degree tamed by this treatment and accustomed to handling, the hood was taken on and off quickly until it was willing to feed. Meat was then offered, and the hood removed, the falconer making a peculiar call at the same time, which was invariably used whenever it was fed, but on no other occasion that it might become acquainted with the voice of its feeder. It was then taught to alight upon the fist from a perch and receive its food, this was called luring the hawk. When it was so far tamed as to come readily when called, it was allowed to remain wholly unhooded, and then put to the lure, an artificial bird, made of feathers and leather, thrown up into the air. To this a live pigeon or dead chicken was attached which it was permitted to seize, and a part of which it was allowed to eat: during this part of its training it was prevented from escaping by a long string. When quite familiar with the lure, it was taught to fly at live game, chiefly by means of a duck, which was blindfolded that it might not escape. The natural disposition of the hawk would induce it to carry off its game when caught, but this was checked by the skill and kind treatment of the Falconer, and more especially by the use of the lure.

Before I quite leave the subject I may mention the curious fact of the attention shown by the Turks and Egyptians to certain hawks, which probably arises from the respect paid to them in ancient times, when the hawk was held sacred and when accidentally to kill one was punished by a heavy fine, and designedly to deprive it of life was a capital offence. The hawks were worshipped for different reasons, some because they were supposed to destroy

scorpions, serpents, and other dangerous reptiles; others again were held sacred because the priests or augurs made use of their swift flight in their divinations. By some they were looked upon as sacred from an ancient tradition stating that once upon a time a book bound with a scarlet thread was brought to the priests of Thebes, in Egypt, by a hawk, in which book were written all the rites and customs of the divine worship of the Egyptians. This extraordinary attention was not only shown to the living birds, but was even more marked by the attention paid to them when dead. Their bodies were wrapped in linen folds, steeped in perfumes and precious oils, in order to preserve them, and in this state they are still frequently found in the mummy pits of Egypt. There are still many superstitions among the Egyptians respecting hawks, similar I suppose to the superstitious fears which are felt by the country people in some places about some birds, such as magpies and crows, of which you must all have heard.

This being the third anniversary of the Society's foundation, H. M. Moule, Esq., moved the following motion:—

That this Society, on the completion of its third year, desires to put on record an expression of its sincere gratitude to the President, without whom it would never have come into existence, and whose wide knowledge and unremitting care, have been the main influences at work in bringing it forward to its present flourishing and promising condition.

That the Society's thanks be on this occasion presented to the past and present officers who have devoted their services to its affairs.

This was seconded by C. M. Bull, Esq., and carried unanimously.

There were 50 persons present.

MEETING HELD MAY 3RD, 1867.

Ornithology.

G. H. DAWSON read a list of notices; and exhibited a nest of the golden-crested Wren.

H. M. HILTON exhibited spotted and unspotted specimens of the eggs of the Jackdaw.

E. IM THURN exhibited a specimen of the Black-backed Gull, shot in the neighbourhood.

Entomology.

F. J. H. JENKINSON read a list of notices. J. W. Parrington exhibited a specimen of *H. Abruptaria.*

Geology.

J. B. OAKELEY exhibited some specimens of *Terebratulæ* and a curious flint deposit.

THE PRESIDENT exhibited a specimen of Platinum.

THE PRESIDENT then read the following paper, illustrated by Photographs, Diagrams, and specimens, on

THE GIANT'S CAUSEWAY.

One of the most wonderful natural objects to be seen in Ireland is the Giant's Causeway, situated in the N.W. of the Island, on the coast of the county of Antrim. The whole surface of this county is composed of, what is termed by geologists, *Trap*, except a small patch of porphyry, yielding a fine white building stone, N. of the town of Antrim. Below this trap occurs a bed of indurated Chalk, and below that Greensand, New Red Sandstone, and Mica Slate—this latter crops out to the West of Londonderry, and in the N.E. of Antrim, thus showing that it extends quite across the county.

For a distance of about two miles inland the ground gradually rises towards the sea till it ends abruptly in a precipice, in many places quite perpendicular, and often 350 or 400 feet high. Here a wonderful sight presents itself. For a distance of four miles along the coast an irregular platform, interrupted by promontories, and composed of the tops of 40,000 pillars, slopes down to the sea, and under it, as far as the eye can reach. The columns themselves are very interesting objects—they are in general about 15 or 20 inches in diameter, one only triangular, three have nine sides, and the majority of the rest five, six, or seven sides. Five and six sides seem to prevail the most. The distance from the bottom of the precipice to the sea is about 730 feet; but the Causeway (as stated above) extends under water, and it is not improbable that it reaches as far as the Island of Staffa, or if the two formations (for at Staffa we meet with a similar formation, known by the name of Fingal's Cave) are now separated, that they originally formed one immense continuous bed of Columnar Basalt.

These pillars fit so closely together that it is impossible to get an instrument between two contiguous ones, in fact a sheet of ordinary paper could barely be inserted between those furthest apart. These columns, moreover, are not formed of one continuous piece of Basalt, but are jointed, and though each joint is perfectly distinct, it is impossible to separate one without damage; the manner in which these pieces are united forming another very interesting feature about the columns. The end of one of these joints has either an indentation or projection, exactly circular, the circumference being as nearly as possible that of the inscribed circle of the polygonal boundary of the

column. If the upper end has a circular indulation, it is exactly fitted by the corresponding projection of the under surface of the joint next above it; but these projections are sometimes on the upper and sometimes on the under surface, so that there is no regularity in this respect. There are, of course, portions of the surface between the circular portion and the edge of the column, especially at the angular points; and these portions are modified so as to form projections upwards or downwards, entirely securing the contiguous joint of the pillar, so that it is necessary to break off the angular projections in order to separate the joints. As the upper surfaces of the joints are indifferently convex or concave, and as the joints themselves do not all lie in the same horizontal plane, it is evident that the "Causeway" is not level, though, as the joints are not very long, when the ends of the pillars form a large surface, it becomes approximately so; in fact in some places the surface is very uneven and groups of pillars have been left projecting above the general surface, many of which have received various fanciful names, as the *Giant's Chair*, the *Priest and his Flock*, the *Nursing Child*, the *King and his Nobles*, &c. Where the pillars have been broken away, so as to leave others of considerable length exposed to view, they have been named the *Organ*, the *Loom*, &c.

Turning from the Causeway itself to the cliffs in which the land terminates, a magnificent spectacle presents itself. Though the Columns of Basalt appear in places they are not more than about 80 feet in length, and appear in layers one above one another. But besides these, the other strata also crop out in this cliff, and thus the dark basalt alternating with the white chalk, the green and red sandstones, and conspicuous beds of lignite and red ochre, which here present themselves, relieved by the bright green of the grass and ferns which find a lodgement on the various projections of the cliff, present a sight as peculiar as it is beautiful.

Two portions of this cliff especially deserve notice.

1.—The *Giant's Amphitheatre*—a bay in the form of an exact semicircle, with the sides everywhere sloping down at the same angle. Round the upper part runs a row of columns 80 feet high; then comes a broad rounded projection, like an immense bench, for the accommodation of the guests of the giant Fin Mac Coul (by whom the Causeway is reputed to have been made); next a row of pillars 60 feet high, and then again a gigantic bench, and so on down to the bottom, where the water is enclosed by a circle of black boulder stones, like the limits of the arena.

2.—The *Pleaskin*, the finest of the promontories which jut out and break the surface of the Causeway. It is at this point more especially where the columns appear in ranges, and the cliff seems as if painted from the brilliancy with which the different strata are here presented to view.

On one of the promontories stand three isolated pillars. The tallest is about 45 feet high. It is said that one of the ships of the Spanish Armada mistook the columns (which were more numerous then) for the towers of Dunluce and wasted their ammunition in firing at them.

There are also two caves which deserve notice.

Portcoon Cave, half-a-mile W. of the Causeway, is only remarkable, apart from its pillars, for its echo, which is tremendous when a shot is fired. "The story goes that this cave was inhabited by a hermit, who, having sworn a solemn oath never to touch food brought to him by human hands, was fed by seals, who carried him provisions in their mouths."

Dunkerry Cave, which can only be entered by water. It is remarkable for the sensation caused by the rising of the water within in response to the swell of the ocean. "As each successive wave rolls into the cave, the surface rises so slowly and awfully that a nervous person would be apprehensive of a ceaseless increase of the elevation of the water till it reached the summit of the cave." This is however 60 feet above high water mark.

At the Giant's Causeway the columns are seldom more than 30 feet high, or one foot broad; but at Fair Head, at no great distance from it, some are no less than 317 feet high, and the *sides* sometimes five feet broad—in fact the whole Head is composed of these columns. It is at this point, too, where the lignite is especially developed. It occurs generally in narrow bands at the Giant's Causeway, but at Murlough Bay, south of Fair Head, it is in such quantities as to pay the cost of working.

It only remains to say a few words on the nature of Basalt and the origin of basaltic pillars. Basalt has the same composition as greenstone (being principally composed of two minerals, augite and felspar), only more fine and granular, and is of volcanic origin. It is, perhaps, the commonest of the volcanic rocks, there being many thousand square miles of it in the Decean in India, as well as large quantities of it in America and elsewhere; and it is by comparing the different formations that we are enabled to obtain a clear insight into the origin of the peculiar form in which it appears at the Giant's Causeway. That it is of volcanic origin there may be inferred at once, from the effect produced on the adjoining strata: for wherever it has come in contact with them, it has affected them for some considerable distance; thus the old Red Sandstone has been converted into Hornstone; the Clay Slate into Flinty Slate; the Coal into Coke; and the Chalk into Granular Marble. This latter is called by the natives Limestone, and is used for building purposes. When burnt it produces a lime more powerful than ordinary lime, and is used extensively as whitewash for purifying the Cottages.

But the question which more especially concerns us is, how have these *Columns* been formed, and why are they jointed? Are they the result of

crystallization? For a long time it was considered that they could not be the result of crystallization, because when split, they presented no *planes of cleavage*; for every crystal can be split more easily in some directions than in others, and when split in these directions always presents a smooth surface, but basalt does not have this peculiarity, and thus the idea of the columns being the result of crystallization was denied. It is now, however, decided that this columnar form is the result of crystallization from cooling under pressure. Mr. Gregory Watt fused 700 lbs. weight of Dudley Basalt, and caused it to cool slowly. Globular masses were formed, which by being continually enlarged pressed against one another until regular columns of basalt were formed. When, again, these columns are examined in a state of incipient decay, the edges are observed to crumble away, and the central portion to assume the form of a ball or egg. This is very visible in other localities; Titan's Piazza, for instance, in Massachusetts, consists of masses of greenstone (similar in composition to Basalt), which have decayed so as to assume large egg-shaped masses. At Bertrich Baden there is a Basaltic cave called the *Grotte de Fromages* (Grotto of Cheeses), because the different joints of the Basaltic columns have become sufficiently decayed so as to assume rounded forms, and thus the cave appears to be formed of columns of cheeses. In other formations, too, we observe that these columns are perpendicular to the cooling surface, and hence there is no doubt whatever but that the basalt was originally thrown up in a state of fusion, that on cooling rows of "centres of crystallization" were formed, which by continually increasing at length pressed against one another, and ultimately formed columns such as we see at the present day at the Giant's Causeway.

The Basalt contains many cavities filled with Calcedony, Zeolite, and Semi-opal. In some instances the cavity is not completely filled with the calcedony or opal: and when that is the case the empty space is observed to be always the upper part of the cavity, when the rock was in its proper place; moreover the surface of the calcedony or opal next to the empty space is always found to be flat and horizontal, which would show that the substance must have been filtered into its situation in a fluid state, and afterwards consolidated.

It may, in conclusion, bo interesting to know how the peculiar shape of these pillars would be assumed by the action of water. The Basalt is supposed to have been first of a clayey consistence, and to have been heated by an underground volcano. The *horizontal* divisions are presumed to have taken place from the mass drying in layers. When clay dries by the action of the atmosphere it contracts, and so, in like manner, as the large mass of Basalt dries, each layer would be separated from the one below. The vertical splitting into columns is supposed to have been caused by the action of the

Volcano underneath. "When the volcano begins to work, a great quantity of the water always present on these occasions, is driven upwards in exhalations and vapours: these possess a penetrating and softening power, by means of which they would also produce the first effect of splitting the mass up into horizontal layers; but when they are increased in sufficient quantity, they force this tough, moist substance upwards like a bubble, which then gradually falls, and during this time bursts into the columns as actually presented by the basalt."

There, are, however, great objections to this explanation. The joints of the different columns, as has been noticed, do not lie in the same plane, and hence there could not be a layer produced by the drying process; nor again is there any reason why it should dry in layers at all unless the process of drying ceased at regular intervals—so, again, in the splitting into columns, the surfaces of the columns are far too smooth and regular to allow of such an hypothesis. This theory, however, was merely started because there were no actual traces of crystallization, but, as has been shown, the absence of these traces has been accounted for.

There were 51 persons present.

MEETING HELD MAY 10TH, 1867.

Entomology.

F. J. H. JENKINSON gave a Report.

Ornithology.

G. H. DAWSON read a list of Notices, and exhibited eggs of the Dabchick and Chaffinch (?).

Geology.

W. D. SMITH exhibited some Coralline Oolite, full of fossils.

THE PRESIDENT exhibited some Balaclava rock and some flints, with conical hollows, from Reigate.

Archæology.

T. R. DUMERGUE exhibited Diagrams of the Marlborough Mount, Silbury Hill, and Waterloo Mound, drawn to scale, showing the great size of the latter, which is the largest artificial mound in Europe.

Botany.

THE PRESIDENT showed specimens of all the plants in flower, as well as of the Gulf-weed (*Sargassum bacciferum*), and a cucumber, with a leaf growing out of its side.

G. F. RUCK exhibited a fasciculated Buttercup.

T. E. MACLEAN read a paper on Beetles.

There were 41 persons present.

MEETING HELD MAY 24TH, 1867.

Entomology.

F. J. H. JENKINSON read a list of Notices.

Botany.

THE PRESIDENT passed round a list of the various flowers found during the half-year, and exhibited a fungus of the genus *Cordiceps* and read the results of some observations on the Giant Puff-ball (*Lycoperdon giganteum*). "In 14 days it had a circumference of 41 inches, "and weighed nearly 7¾ lbs. When completely dried it was found, "that in a fresh state it contained 91·28 per cent. of water; the "total number of cellules was 14,589,140,400 which had been formed "at the rate of 12,000 a second. It had also formed 1,200,000 spores, "and extracted the carbonic acid gas from ⅞ of a pint of air every "second."

Ornithology.

G. H. DAWSON read out the Notices obtained during the past fortnight, and exhibited peculiar varieties of the eggs of the Greater Tit and Song Thrush. J. W. Parrington, those of the Garden Warbler, and A. Herklots, those of the Rook, and Greater Tit. E. Almack and E. im Thurn passed round nests of the Humming Bird; the latter of whom also exhibited a White Sparrow and Mottled Blackbird.

Zoology.

THE PRESIDENT exhibited a specimen of *Mermis nigrescens*, a thread-like animal, living either in water or damp earth, which had been discovered by J. B. Gilmore, Esq., on the leaf of a dandelion, and which had appeared in great numbers in some parts of England.

W. R. CARLES then read a short paper on Frogs.

THE LIBRARIAN mentioned that J. B. Gilmore, Esq., had presented Dana's Mineralogy to the Society; H. A. Evans a work on British Spiders, and the President Morris' Catalogue of Fossils.

There were 38 persons present.

The following paper on the Genus Eupithecia, kindly written for the Society by the Rev. Joseph Greene, was read at one of the meetings of the Entomological Section.

THE GENUS EUPITHECIA (*Curt.*)

The pretty and interesting little insects contained in this Genus are known familiarly to the "brotherhood" by the name of "Pugs." It seems at first difficult to decide upon the origin of this term. If, however, the name

Eupithecia be derived from εὐ-πίθηκος (resembling apes), then, as these latter, when kept as "pets," are often denominated "pugs," we may possibly find the explanation in this fact. Why Mr. Curtis considered them as resembling apes it is not for me to say.

In the first edition of "Westwood and Humphrey's British Butterflies and Moths," thirty-five species are described. Of these, at least ten may be discarded as mere varieties. Of the remainder, about twelve may be recognized from the figures, which are good. But, as regards the rest, owing to the bad colouring, and the vague descriptions given in the letter-press, it is quite impossible to determine what they are. Mr. Westwood, however, is not to blame for this, as no amount of skill in word painting will enable the collector to separate the closely allied species. This can only be done by comparing the perfect insects—but, better still, by rearing them from the larva. In the year 1849, Mr. H. Doubleday called the attention of entomologists to this Genus, observing that they had been very little attended to in Britain, and that probably many new species would be discovered. This appeal does not seem to have produced much fruit. About 10 years later, the Rev. H. H. Crewe applied himself to the work in the only way which offered a prospect of success, viz, by breeding. His great skill and unwearied assiduity have produced astonishing results, which may be briefly summed up as follows:—We have now forty-seven clear and well-defined species, and the nomenclature satisfactorily settled. Of these one (*Fraxinata*, Crewe) is new to science. The larvæ of no less than *forty* have been discovered (the vast majority by Mr. Crewe) and described, leaving only seven yet unknown. They are—*Consignata*, *Egenata*, *Irriguata*, *Pernotata*, *Pygmæata*, *Subciliata*, and *Togata*. The discovery of the larvæ of one or more of these would be a great feather in the cap of the Marlborough College Entomologists.

I shall now proceed to give a list of the species as at present ascertained, with the time of appearance of the perfect insect and larva, together with the trees and plants (when known) upon which they feed. I shall then add some remarks upon all, or most of them, and conclude with a few hints as to searching, breeding, pairing, &c.

Species.	Imago.	Larva.	Food.
1. Venosata ...	June	August	Campion and Catchflies (seed)
2. Consignata	April & May	...	Apple ?
3. Linariata ...	June	July & Aug.	Toadflax (flowers and seeds)
4. Pulchellata	July	August	Foxglove (flowers)
5. Centaureata	Ditto	Sept. & Oct.	Ragwort, Saxifrage, &c. (seeds)
6. Subfulvata	Ditto	Aug. & Sept.	Yarrow (flowers and seeds)
7. Succenturiata	Ditto	Sept., &c.	Atriplex (ditto ditto)

stalks. Plants growing in hedgerows seem more productive than those in woods.

5.—*Centaureata.* This is a common insect. The larva feeds in a great many plants, preferring, however, according to my experience, the Ragwort *(Senecio jacobœd)* and especially the Burnet saxifrage *(Pimpinella magna)*. From the former it is best taken by beating into an umbrella—from the latter, by sweeping, or carefully examining the seeds. It is a very variable larva, and, from the fact that both its colour and markings are more or less influenced by the plant on which it is feeding, it often puzzles the collector.

6.—*Subfulvata.* There is nothing very noticeable about this species. I have frequently taken the perfect insect on the blossoms of the common Privet, the flowers of which it seems very partial to.

7.—*Succenturiata.* This is a rare, or at least local, species. It appears to prefer the coast. In its natural state, the larva seems to feed on the Mugwort *(Artemisia vulgaris)*, *Atriplex*, &c. In confinement, it will take to the Yarrow *(Achillea millefolium)* though it does not seem to thrive upon it.

8.—*Subumbrata.* This is also a rare species, but not uncommon where it occurs. The perfect insect may occasionally be taken in the day time, by beating the trees, where the insect is found.

9.—*Pernotata.* Of this nothing is known accurately. Mr. Doubleday, I believe, has a specimen. The larva is said to feed on Golden-rod.

10.—*Plumbeolata.* The larva of this species for a long time baffled Mr. Crewe. It was at last discovered, in 1865, to feed upon *Melampyrum arvense.* It is said to be difficult to detect, and has been bred by but few. I have not met with it.

11.—*Isogrammata.* This little insect is sure to be met with wherever the Traveller's joy *(Clematis vitalba)* abounds. The larva feeds in the unopened buds, not flowers or seeds, and its presence may easily be detected by the little brown hole at the side of the bud. Many are, however, destroyed by a small brown bug, which, by some means or other, gets inside the bud, and, having seized the unfortunate larva with its proboscis, does not relinquish its hold until it has extracted all its juices, leaving nothing but a dry and shrivelled skin.

12.—*Pygmœata.* Larva unknown. Supposed to feed on *Stellaria holostea.*

13.—*Helveticata.* This is a Scotch insect. I am not aware of any English locality. The larva feeds on the common Juniper *(Juniperus communis)*.

14.—*Arceuthata.* Mr. Crewe has taken what is supposed to be this species, at Drayton Beauchamp, Bucks. It feeds on the same plant as the preceding.

15.—*Satyrata.* Local, but not uncommon. The larva is found on a great many plants, as *Centaurea nigra*, *Knautia arvensis*, &c. In confinement it will feed on the flowers of the common Dandelion.

16.—*Egenata.* Concerning this species I know nothing, either of the larva or perfect insect.

17.—*Castigata.* Common everywhere. The larva may be found, feeding on almost any flower.

18.—*Lariciata.* This species closely resembles the preceding in the perfect state, but differs widely from it in the larva. It was only discovered in 1865. It seems by no means rare, and will probably be easily taken, by beating larch and fir in various localities.

19.—*Virgaureata.* This also closely resembles the two preceding species. It seems rather local, but where it does occur it is abundant, that is, in the larva state. The specific name indicates the food plant, Golden-rod. It is, however, found just as commonly—according to my experience, much more so—on Ragwort. I have taken it in profusion on the Cumberland and Cheshire coasts. It has a habit of twisting itself into something like the form of an S, by which, and its much slenderer shape, it may easily be distinguished from *Absynthiata.*

20.—*Trisignata.* This is a dull coloured, but very distinct species. It was first discovered in this country, a few years since, not far from my house. It has since been taken in many other localities. The larva may be known at once by its *black* head; it eats the flowers and seeds of the common *Angelica sylvestris.* Wherever this plant occurs in any profusion, the insect will probably be found, though it seems to be rather rarer and more local than *Albipunctata*, of which mention will be made hereafter. This plant seems to flourish best in moist marshy places, and though it grows in damp ditches, &c., I have never found the larva except in *woods*, plantations, &c.

21.—*Valerianata.* This insect was first taken in this country in the year 1858, and was then described by Mr. Doubleday as new to science, under the name of *Viminata.* Subsequent investigation has shewn it to be identical with Hübner's *Valerianata.* It is a very dull-coloured insect, and continued to be very rare until Mr. Crewe discovered the larva. It is still far from common, and is in few collections. The caterpillar feeds on the *flowers* of the White Valerian (*Valeriana officinalis*). This plant grows in osier beds, damp ditches, &c., and if the insect occurs at all in the locality, the larvæ may be taken in some plenty. As the flowers are very short-lived, and speedily drop off, care should be taken to search at the exact time. The best way is to beat them into an umbrella.

22.—*Pusillata.*—Not much is known about this species. It is not a common insect.

23.—*Irriguata.* Very rare. The perfect insect has been taken in North Wales, and some other localities, with which, however, I am not acquainted. The larva is said to feed on the Sloe *(Prunus spinosa)*, but I am not aware of its having ever been bred in this country; it is in few collections, and I do not possess a specimen.

24.—*Pimpinellata.* Not common. The larva feeds on the seeds of *Pimpinella saxifraga.* It is, however, difficult to find, except by sweeping. A careful examination will disclose the larvæ rigidly extended from the slender stalks, but they so closely resemble these stalks as to require a very experienced eye to detect them.

25.—*Fraxinata.* This insect is new to science, and has been described and named by Mr. Crewe. It was formerly confounded with the Continental *Innotata*, which it closely resembles in the perfect state, but the larvæ differ widely, both in appearance and food—that of *Fraxinata* feeding *exclusively*, in a state of nature, upon *ash*, while *Innotata* is found on various wild plants. This must be regarded as one of the rare species. The perfect insect is sometimes taken at light, and the larva occasionally on ash. Unquestionably the best way of procuring the insect is by searching for the pupa; this may be done throughout the winter and early spring. It lies concealed under the moss collected upon the trunks of ash trees, especially near the edges, and the moss must therefore be very carefully removed with the hands. Were this plan more generally adopted, I have little doubt that the insect would become commoner, as I can generally take from four to twelve in a season, and others who have tried it have met with similar success. It requires, however, a very considerable amount of patience and perseverance.

26.—*Albipunctata.* The larva may be taken in abundance upon the same plant as *Trisignata.* I have, however, observed that where *Albipunctata* is plentiful, *Trisignata* is rare, and *vice versâ.* I mean when they occur in the same locality. The larva is very seldom found except upon such plants as grow in woods. On one occasion, however, I might have taken hundreds feeding on Angelica, in a marshy field in Suffolk. Both species are sometimes on *Heracleum sphondylium.*

27.—*Indigata.* Not common.

28.—*Distinctata.* The larva feeds on *Thymus serpyllum*, but it is extremely difficult to find, owing to the nature of the plant.

29.—*Nanata.* This is exclusively a heath insect, and it is not at all uncommon. The caterpillar is very pretty, and may be taken in abundance, by sweeping the Heather and Ling.

30.—*Subnotata.* Not very common. Best taken by sweeping the food plants, the various species of *Atriplex* and *Chenopodium.*

31.—*Vulgata.* This, as its name indicates, is a very common insect. It is very fond of settling upon palings in the daytime. The larva will feed upon any plant, and a good many trees.

32.—*Campanulata.* This insect was only added to our list in 1864. The larva feeds in the seed capsules of the Nettle-leaved Bell-flower *(Campanula trachelium)* and wherever that plant grows, the insect has been taken in plenty. In confinement it will readily feed upon the various species of garden *Campanula.*

33.—*Expallidata.* This is one of the largest and finest insects in the Genus. The larva also is very handsome; it feeds upon the flowers and seeds of the Golden-rod *(Solidago virgaureæ)*, but in confinement will eat Ragwort, preferring, however, the former plant. It is a rare moth, but may occasionally be taken in some plenty where the Golden-rod abounds, especially when it grows in cleared spaces in woods.

34.—*Absynthiata.* This is a very abundant species in the larva state, and may almost certainly be taken wherever Ragwort grows.

35.—*Minutata.* Exclusively a heath insect, and the larva may commonly be taken by sweeping.

36.—*Assimilata.* Common. The larva feeds on the leaves of various Currant trees, also the wild Hop. Its presence may easily be detected by the little round holes gnawed in the leaves; upon turning them up, the caterpillar will be seen lying extended upon the midrib.

37.—*Tenuiata.* The larva of this pretty little species feeds inside the catkins of the Sallow (*Salix caprœa*). The best way to procure it is by gathering a large quantity of the catkins just before they are ready to fall. These should be placed in a good-sized box, with a gauze cover. Nothing more is required, and the insects will appear in June and July.

38.—*Subciliata.* This is a rare species, and at present nothing is known of the larva. It is almost certain, however, that it feeds on the common Maple, and probably in woods.

39.—*Dodonœata.* Larva feeds on Oak, probably also on Hawthorn, as I have taken the pupa under loose bark on those trees.

40.—*Abbreviata.* This and *Helveticata* are the two earliest of the Eupithecise on the wing. The larva feeds on Oak, and the pupa may occasionally be taken at the roots of that tree.

41.—*Exiguata.* The larva of this species is one of the prettiest in the Genus. It feeds on Bramble, Sloe, Barberry, and other shrubs. It is rather common, but seems uncertain in its appearance. The perfect insect is frequently taken on the wing, or settled upon palings, &c.

42.—*Sobrinata.* Common where Juniper grows.

43.—*Togata.* This is far the largest species in the Genus, and, when fresh, the handsomest. It is very rare, and, so far as I know, has only occurred in Bucks, at Black Park and at Halton, where I twice took it. The larva is as yet unknown, but is supposed to feed either on larch or fir, from the fact that the perfect insect has always been beaten from those trees. This is, however, a very fallacious test, as many species which feed on low growing plants are in the habit of concealing themselves, when in the perfect state, among the foliage of the surrounding trees.

44.—*Pumilata.* Double brooded. The larva will feed on almost anything.

45.—*Coronata.* The larva of this delicate species feeds in the *flowers* of *Clematis vitalba.* It is difficult to rear. The best way to take it is to shake, not beat, the flowers violently into an umbrella.

46.—*Rectangulata.* This is a very common insect, and may be taken in almost any orchard, settled upon the trunks and branches.

47.—*Debiliata.* Till lately, the larva was unknown. It feeds, early in the spring, on *Vaccinium myrtillus,* spinning two or three leaves together. This latter habit is found in it alone of all the Eupitheciæ. It seems to be an extremely local species, but is common where it does occur. The perfect insect seems very fond of settling in hollow trees during the daytime.

Capturing, rearing, &c. Very few of the insects in this Genus are to be taken on the wing, and of those that are, the vast majority are, more or less, wasted and unfit for cabinet specimens. Still fewer are to be taken in the pupa state. There remains, therefore, only searching for the caterpillars. This may be done in three ways, beating, sweeping, and searching. To commence with the last. By searching, I mean the careful and minute examination of the plants and flowers on which the larvæ feed, without having recourse either to beating or sweeping. There are several species which can *only* be obtained in this way—there are many others, which *may.* The former are Nos. 1, 3, 4, 11, 28, 32, 47. For sweeping it will be necessary to procure a small iron hoop, about the thickness of a common clay pipe-stalk, and ten inches, say, in diameter. This must be firmly inserted into a wooden handle, which may be two feet in length. To the hoop must be fastened a calico bag. The length is immaterial, but a foot and a half will be enough. The part of the bag which laps round the hoop should be very thick and strong, else it will soon be frayed away by the friction. With this net, the herbage, and low growing plants are swept from side to side, or backwards and forwards. After a dozen or so strokes, the bag is turned inside out, and the debris carefully examined, and a wonderful medley it generally is, bees, wasps, spiders, earwigs, flies of all sorts, bugs, &c. The species to be sought in this way are, 10, 24, 29, 35. Though only four species are given as being most

easily procured by sweeping, it must be remembered that the *net* is most useful in obtaining the larvæ of many other insects.

Beating is the simplest operation in the world. Seize a quantity of the flowers in one hand, and beat them on the ribs of an open umbrella, or, if preferred, strike the flowers with a small stick. This is all. The tree and shrub feeding larvæ of course *must* be beaten. What these are, may be seen by referring to the list. The larvæ, when found, should be put with some of the food into chip pill-boxes, and these in their turn into a bag, for convenience sake. In the case of flower and seed eating larvæ, six or eight may be placed in the same box, if a good supply of flowers be put in with them. Where, however, they feed on trees or shrubs, it is better to put only one larva in each box.

The rearing of these little creatures is very simple and easy. An examination of the list will show, that, out of the forty known larvæ, twenty-eight feed on various plants. To rear these, procure half-a-dozen moderate-sized chip toy boxes, or something similar. Knock out the lids, and cover the frame with gauze. Cover the bottom, to the depth of an inch, with fine mould—upon this put a thin layer of loose moss. It is well to *bake* both mould and moss. Your apparatus is now ready, and all that remains is, to put in a handful or two of the flowers, or seeds varying in quantity according to the number of larvæ. For those larvæ, which feed on the following plants, nothing more will be required than occasionally to renew the food, which may be thrown in on the top of that already there; Campions, Catchflies, Toadflax, Foxglove, Ragwort, Yarrow, Orache, Knapweed, Scabious, Golden-rod, Clematis, Thyme, Campanula, Sallow Catkins. As regards the remaining flowers, as well as trees and shrubs, in order to keep the food fresh, and to avoid constant renewing, the best plan is as follows:—Procure a few short bottles, about 2½ inches in length. Fill these with water, and place the flower or sprig of the tree in them, first twisting a little cotton wool round that part of the stem, which meets the neck of the bottle. These bottles thus prepared must be placed in some upright vessel, as a tin box, jam-pot, &c., from 10 to 12 inches in height, so as to allow room for the plant. Surround the bottle with mould and moss as before, and, having tied a piece of gauze on the top, your case is ready.

I think I have now said enough, but any further information will with pleasure be given to any one who may apply to me by letter.

Let me, in conclusion, strongly recommend the pursuit of this Genus to the College Entomologists. The species are numerous, and many of them very pretty. The larvæ are extremely easy to find, and when found, bred with equal ease. The food plants, or most of them, are common everywhere, and lastly, the apparatus for finding and rearing the caterpillars extremely simple

and inexpensive. For the former nothing is required but an umbrella, a walking stick, and in some cases, a sweeping net; for the latter, only a few boxes, jam-pots, or, in fact, anything that will prevent the larvæ from escaping. I give my address, in case any one might wish to apply to me for further information.

CUBLEY RECTORY,
SUDBURY, DERBY.

MEETING HELD JUNE 14TH, 1867.

Ornithology.

G. H. DAWSON read a list of Notices observed since the last meeting, and exhibited eggs of the Grasshopper Warbler, and Reedwren.

E. IM THURN exhibited a duck with four legs; the skin of the Laughing Jackass, an Australian species of Kingfisher; and a case of Hawks, which he presented to the Society.

J. W. PARRINGTON exhibited some discoloured eggs of the Great Tit, from a deserted nest.

A pair of Pheasants in their ordinary plumage, and a pair of the pie-bald variety of the same, presented to the Society by Mr. Gauntlett, head gamekeeper to the Marquis of Ailesbury, were also exhibited.

Entomology.

F. J. H. JENKINSON read a list of Notices.

T. R. DUMERGUE exhibited a pair of the new Silk-worm Moth, (*Attacus Cynthia*), with Cocoon and specimen of Silk.

H. M. HILTON exhibited *G. rubricollis*, *A. Degeerella*, *N. Lucina* and *A. Rubidata*, recently captured by him.

THE PRESIDENT exhibited a wasp's nest, entirely destroyed internally by the larvæ of *A. Colonella*.

Geology.

W. D. SMITH exhibited a series of Chalk, Greensand, and Oolite Fossils, from Savernake and Swindon.

THE PRESIDENT exhibited a mass of pins dug up from a garden in Kent; and some sand fused by lightning into the shape of a funnel.

P. G. MAITLAND exhibited a Madrepore from Devonshire, and Violet quartz coloured by Potassium.

Botany.

THE PRESIDENT passed round a list of Notices, and exhibited specimens of *Aira Caryophyllea* and *Carex hirta*, two species new to the College List, found by E. im Thurn and G. F. Ruck respectively.

R. B. MAINWARING exhibited a Carved Gourd from British Guiana.

R. F. ISAACSON read a paper on White Ants, illustrated by a diagram, and a specimen of the Queen Termite, preserved in spirits.

There were 76 persons present.

MEETING HELD JUNE 21ST, 1867.

THE TREASURER read his report, showing an available balance of £4 6s. 6d.

Ornithology.

THE PRESIDENT exhibited the skull of an Albatross, from Formosa.

J. W. PARRINGTON exhibited a Cuckoo, which he also presented to the Society.

E. IM THURN exhibited a Woodcock shot in the neighbourhood.

Botany.

THE PRESIDENT read out a list of notices, among them two plants new to the College list; *Helosciadium inundatum*, found by J. W. Parrington, and *Torilis nodosa* by G. F. Ruck.

Zoology.

A. P. HOCKIN exhibited the rattle and teeth of a Rattle-snake.

E. IM THURN then read the following paper, illustrated by a very fine collection of specimens, on

BIRDS' NESTS.

I have chosen birds' nests as my subject for to-night, for several reasons; but I have found it rather a difficult one, as it is such a large subject that it would require at least a dozen papers to give a correct idea of the nesting habits of one single British bird. This being the case I have determined to point out the most interesting facts concerning those nests which seem to be most curious, either in position, material, or shape. A collection of nests, if it is a good one, is most interesting, especially if the eggs are preserved with them; in this way the eggs themselves are far more interesting than if they were merely arranged in little wooden partitions lined with white or pink cotton wool, as it gives one a much better idea of the eggs; besides showing the nest, which is almost as interesting, it is also much easier to identify the eggs with than without the nests. Foreign nests are perhaps more curious than English ones, but are in a great many instances inferior to ours in beauty, there are few nests of any country more beautiful than that of the Chaffinch, one of our commonest. The chief reason why foreign birds' nests

are so much more admired, is more from the position in which they are placed than anything else, as they are not made so beautifully; but they are suspended in such curious positions, and so strongly, that it seems almost impossible that they are built by animals which have nothing but instinct, and that not very strong, to guide them By far the most curious of all is the Tailor Bird, which, having chosen two or more leaves, first drills holes all down the edges of them with its beak, and then actually sews the leaves together with the fibres of a certain plant so as to form a kind of pendent bag, in which it builds its nest. This nest belongs to a class of which we have but very few examples in England. They are called pendulous nests, the Golden-crested Wren being the chief, if not the only, British representative: but abroad in the Brazils, in Africa, and to some extent in Australia they abound, and are perhaps the most plentiful of all there, and it is curious that they are not more frequently sent over to England amongst the hundreds of birds' skins, and other objects of natural history which are annually brought into London and Liverpool. In the Brazils one of the most curious nests is that built by the Brazilian Wood Nymph, which is itself one of the brightest and prettiest coloured birds in existence. This nest is very small indeed, like those of most other humming birds, and is built of the down out of the pods of the silk-cotton tree, as it is called by the natives, interwoven with the most delicate kinds of lichen. But here again, its chief interest arises from the position in which it is built, as it is attached to the slenderest tendril of some creeper, which, having climbed up round the trunk of some tree, allows its tendrils to hang loosely down and blow about in the wind. It is on one of these tendrils generally, resting on two of the leaves, that the Wood Nymph builds its nest. Another bird of South America, the little Hermit Humming-bird, builds its nest, which in shape is not unlike that of our common House-martin, adhering to the end of some broad palm leaf, instead of the walls of a house. There are other Humming Birds in the same country which build nests of the same shape, only adhering to the ledge of some rock, thus resembling even more closely our common Martins.

In Africa the most curious nests are those built by the family of Weaver Birds, which all build domed nests, though they are of course various in shape. They are supported in some instances by means of long rope-like appendages formed by the birds themselves of the same material as the nest; and it is curious to notice how some nests, that of the Little Hermit amongst others, have this long rope hanging down from the bottom of the nest, without any object, that is without any object which has yet been found out by the closest observers of nature. Other Weaver Birds build soft round hollow balls, with a hole a little below the top, the materials of which are carefully woven round three or four neighbouring twigs. There is one bird in England which

builds a nest somewhat similar to the latter kind of Weaver Birds; it is that of a bird very common in the forest, but whose nest curiously enough is not often found, the Long-tailed Tit, which, unlike most of our English Tits, does not build in the hole of some tree, but builds a domed nest supported in the same way as some of the Weaver Birds. The material is usually a small quantity of wool with a great deal of lichen. The entrance into the nest is so very small that one would think it almost impossible for a bird to get in. The bird itself is very curious, and seems almost more like a mouse than a bird, for one can well imagine all these downy feathers turned into fur. The specimen which I have here was procured in a garden not far from the College out of a juniper tree.

As to pendent nests there are very few English ones indeed besides that of the Gold-crest, but there are two birds which usually build near the water, and make what are generally called semipendent nests. These are the Sedge Warbler and the Reed Warbler; the former of which is still pretty common about here, and builds a very large nest, at least forms a large mass of material, but the real hollow for the eggs is very small in comparison; the latter, the Reed Warbler, I am told, used to be very common about here, but must now be reckoned almost one of our scarce birds. It builds a very pretty nest indeed, sometimes fastening it to three reeds, and sometimes building it in the fork of some low bush growing near the water.

So much for the pendent nests, but amongst domed nests the case is different; we have a good many English birds which build domed nests, the prettiest and cleverest built of which is that of the common wren. This nest is built generally against the side of a tree, or just under the thatch of a barn, sometimes buried in the side of a hay stack. It is usually built of the material best calculated to hide it from sight, and this is, I believe, the great reason why this bird is still so common everywhere, as though a great many nests are undoubtedly taken every year, still a great many are so well concealed that they escape notice, and the parents rear their young in safety. I have seen nests built of three distinct kinds of moss, of dead leaves, of dry ferns, and even of little pieces of straw. This bird has a curious habit of building nests very early in the year, which they never line. The fact of their never being lined forms the great distinction between these "Cocks' nests," as they are called, and the true ones, as the wren in building a nest in which to rear her young uses an immense amount of feathers. It is supposed that they build these cocks' nests to protect them from cold during the night; I believe that this is about the only bird known to build a nest merely for the sake of warmth. The Chiff-Chaff also builds a very beautiful domed nest, but usually on the ground, forming it of dry hay and fern, among which latter it is generally placed. There is one bird very common here, that builds a domed nest so very different from those

that I have mentioned here that I cannot pass it over. I mean the Magpie, which builds a nest of enormous size in the top of some tree, occasionally, however, it builds in some tall bush, from which circumstance it has long been erroneously supposed that there are two different species of this bird, the bush Magpie and the tree Magpie. This is now, however, proved to be entirely without foundation. The nest is built of thorns and brambles, of which a tremendous amount are used, the longest and sharpest being always used for the dome, so that it is often a very painful operation to get one's hand into the nest.

Besides these classes of nests there are two others, both of them very plentiful in England. The largest of the two contains all the nests which are built in holes in the trees. The forest contains a great many different examples, the commonest of all amongst little birds being the different kinds of Tits which build in holes in the hollow thorn trees. They make a very flat nest, if it can indeed be called a nest, being merely a platform of moss, hair, and other materials on which to lay their eggs. Almost as common as the Tits in a certain part of the forest, that near the Braden Oak, are the Redstarts, which lay a pretty little blue egg in very much the same kind of hole as the Tits. Amongst larger birds we have the Jackdaws, which build in immense numbers here, generally in a hole high up in some beech tree; and almost more plentiful still are the Starlings. If any one were to walk slowly along the Grand Avenue he would get a very fair idea of our tree-building birds; he would see plenty of Jackdaws and Starlings, occasionally a Nuthatch or Tree-creeper, and now and then he would observe a very neat little round hole in which some bird has evidently built its nest, and from which would fly most probably a bird, which is fast becoming rare in England, but of which we still retain a good number, more, it is said, than in any other part of England. The Woodpecker usually makes a hole for itself, beginning where some bough, torn down by the wind, has left a hollow in the tree. The rain settling in this natural cavity gradually renders the wood softer and thus makes the Woodpecker's task very much easier. Being also in the habit of piercing the wood in search of its food, nature has provided this bird with a beak exactly fitted for the purpose. Inside this hole it lays its eggs on the soft chips of wood without making any nest at all. The diagram, which I have here, represents a section of the nest of the lesser spotted Woodpecker, presented by Mr. Gould to the British Museum. The common green Woodpecker makes its hollow exactly in the same way, only of course considerably larger in comparison.

The last class of nests contains those which are built on or in the ground. Amongst those which build in the ground are the Kingfishers, the only bird which at all equals foreign ones in its colours. It is pretty common here though its nest is well concealed and therefore not often taken. I have seen

no less than nine Kingfishers in different parts of the river within the last few months, and from the fact that most of them were on the Og, I presume they are commoner there than on the Kennet, Very little, however, can be said in favour of the nest, notwithstanding the beauty of the bird. It is built in a hole in the ground, very often in a rat's hole, and as it is formed of fish bones which the bird has cast up, and which have a most horrible smell, a Kingfisher's nest is by no means pleasant to the nose. There has long been a story that the British Museum had offered £100 for a perfect specimen of a Kingfisher's nest; I myself believe this to be a perfect myth; one thing, however, is certain, the British Museum has now for several years possessed a good specimen of a Kingfisher's nest, procured and presented to it by the same Mr. Gould whose name I mentioned before in connection with the Woodpecker's nest. Another bird which builds in holes, the Sandmartin, excavates a hole for itself, for it breeds in large flocks; they used to be very abundant at Savernake, but I am informed that this year they have either entirely deserted the spot or else have changed their breeding place. Besides these there are several species of sea-birds, which build in holes in the ground, the Puffin, which usually breeds in deserted rabbit burrows, and the Stormy Petrel, which like the Sandmartins breeds in large flocks, excavating its own hole. There are a great many birds which build on the ground, the commonest, here at least, is the Pewit or Lapwing, which can scarcely be said to build a nest, but lays its eggs in a hollow in the ground. There are besides this several little birds which build on the ground, amongst others common here are the different kinds of Larks. In conclusion I have to mention one bird whose nesting habits are so peculiar that they still furnish naturalists with an endless subject for discussion, the Cuckoo, which as you must know builds no nest of its own, but lays its eggs and deposits them in the nests of some other birds, leaving the young to be reared by the true owners of the nests. The few nests on the table have all been collected in this neighbourhood during the last few weeks.

The following summary of proceedings was then read:—

	1867.	Corresponding half 1866.
Total number of Exhibitions... ...	157	154
Average number per meeting ...	17-7	15-4
Average number of persons present at the meetings	47-5	44
Average number of visitors	25-5	25

ENTOMOLOGICAL NOTICES.

At the beginning of the season Lepidoptera were unusually forward, as may be seen by reference to some of the dates of species that hybernate, two of which, (*V. Urtica* and *G. Rhamni*) were taken on the 15th of February; but, on the whole, the season cannot be called forward, as, since the beginning of May, scarcely anything has been earlier than last year; on the contrary, nearly all have been a week or more later.

In the following list, those marked thus (*) are new to the locality; those marked (H) were *hybernated* specimens.

Names of those whose initials occur in the List.

F. F. B.	F. F. Back.
F. J. C. B.	F. J. C. Boles.
H. E. B.	Rev. H. E. Booth.
C. F. B.	C. F. Braine.
C. M. B.	C. M. Bull, Esq.
G. W. C.	G. W. Creaton.
E. H. D.	E. H. Davis.
F. F.	F. Ffolkes.
H. G.	H. Glasse.
A. C. H.	A. C. Hilton.
H. M. H.	H. M. Hilton.
A. P. H.	A. P. Hockin.
G. H.	G. Holden.
R. F. I.	R. F. Isaacson.
F. J. H. J.	F. J. H. Jenkinson.
P. T. M.	P. T. Macquoid.
R. B. M.	R. B. Mainwaring.
H. M.	H. Manders.
J. W. P.	J. W. Parrington.
R. P.	R. Phayre.
G. P.	G. Podmore.
T. A. P.	Rev. T. A. Preston.
B. W. R.	B. W. Repton.
G. F. R.	G. F. Ruck.
M. H. S.	M. H. Smith.
E. IM T.	E. im Thurn.
W. W.	W. Ward.
J. F. W.	J. F. Wilkinson.
F. J. W.	F. J. Wiggin.
L. H. Y.	L. H. Young.

LEPIDOPTERA.

RHOPALOCERA.		Date.	Captor.
Gonepteryx Rhamni ...	Brimstone	Feb. 15.	
Colias Edusa	Clouded Yellow ...	H. May 29.	*J. W. P.*, seen.
Pieris Brassicæ	Large White ...	April 28.	*H. M. H.—A. C. H.*
P. Rapæ	Small White ...	April 3.	*F. J. H. J.—A. C. H.*
P. Napi	Green-veined White	May 3.	*F. J. H. J.—H. M. H.*
Anthocharis Cardamines	Orange Tip... ...	May 2.	*G. P.*
Lasiommata Ægeria ...	Speckled Wood ...	April 29.	*A. P. H.*
L. Megæra	Wall	May 29.	*F. J. H. J.*
Hipparchia Janira	Meadow Brown ...	June 22.	*F. J. H. J.—H. M.—F. J. C. B.*
H. Tithonus	Gate-keeper ...	Not by June 26.	
Cœnonympha Pamphilus	Small Heath ...	May 28.	*A. C. H.*
Cynthia Cardui	Painted Lady ...	H. May 8.	*F. J. H. J.—A. C. H.—H. M. H.*
Vanessa Atalanta	Red Admiral ...	H. April 3	*R. F. I.*
V. Io	Peacock	H. April 2.	*C. M. B.*
V. Polychloros	Large Tortoise-shell	May 1.	*J. F. W.*
V. Urticæ	Small Tortoise-Shell	H. Feb. 15.	*G. H.*
Argynnis Selene	Small Pearl-bordered Fritillary	June 9.	*A. C. H.*
A. Euphrosyne	Pearl bordered Fritillary... ...	May 29.	*C. F. B.—F. J. H. J. H. M. H.—P. T. M.*
Melitæa Artemis	Greasy Fritillary	June 10.	*F. J. C. B.*
Nemeobius Lucina... ...	Duke of Burgundy	June 9.	*A. C. H.*
Chrysophanus Phlœas ...	Small Copper ...	May 16.	*J. W. P.*
Polyommatus Alsus ...	Bedford Blue ...	June 10.	*F. J. H. J.—F. J. C. B. H. M. H.—A. C. H.*
P. Alexis	Common Blue ...	June 22.	*F. J. H. J.—H. M.*
P. Agestis	Brown Argus ...	June 10.	*C. F. B.*
Thymele Alveolus	Grizzly Skipper ...	May 8.	*A. C. H.*
Thanaos Tages	Dingy Skipper ...	May 18.	*F. J. H. J.—J. W. P.*
Pamphila Sylvanus ...	Large Skipper ...	June 10.	*F. J. C. B.—B. W. R.*
HETEROCERA.	SPHINGINA.		
Procris Statices	Green Forester ...	June 9.	*F. J. H. J.—H. M. H.*
Smerinthus Ocellatus ...	Eyed Hawk-moth	May 29.	Bred *T. A. P.*
S. Tiliæ	Lime Hawk-moth	April 12.	Bred.

		Date.	Captor.
Sphinx Ligustri	Privet Hawk-moth	June 8.	Bred *T. A. P.*
Chærocampa Elpenor ...	Elephant do. ...	June 15.	*F. F.*
Macroglossa Stellatarum	Humming-bird H.	May 8.	*F. J. H. J.*
	BOMBYCINA.		
* Hepialus Hectus... ...	Golden Swift ...	June 16.	*F.J.H.J.—F.J.C.B. —H. M. H.*
H. Lupulinus	Common Swift ...	June 5.	*M. H. S.*
H. Humuli	Ghost	June 18.	*G. W. C.*
Dasychira Pudibunda ...	Pale Tussock ...	June 10.	*J. W. P.*
Gnophria Rubricollis ...	Red-necked... ...	June 10.	*F.J.H.J.—A. C.H. H. M. H.*
Nudaria Mundana		June 24.	*F. J. H. J.*
Euthemonia Russula ...	Clouded Buff ...	June 13.	*F. J. W.*
Nemeophila Plantaginis	Wood Tiger... ...	June 10.	*B. W. R.*
Spilosoma Menthasti ...	White Ermine ...	May 11.	*R. P.*
S. Lubricepeda	Buff Ermine ...	May 31.	*R. B. M.*
Diaphora Mendica	Muslin...	May 19.	*F. J. C. B.*
Callimorpha Jacobææ ...	Cinnabar	June 13.	*F. J. H. J.*
Drepana Falcataria ...	Beautiful Hooktip	May 10.	*F. J. H. J.*
D. Hamula	Pebble Hooktip ...	June 11.	*A. C. H.*
D. Unguicula...		May 7.	*H. G.*
	NOCTUINA.		
Mamestra Brassicæ		June 9.	*F. J. C. B.*
* Miana Strigilis		June 22.	*F. J. H. J.*
Grammesia Trilinea		June 9.	*F. J. H. J.*
Triphœna Pronuba		June 14.	Churchill.
* Noctua Brunnea		June 3 (?)	*R. B. M.*
Tæniocampa Gothica...		Feb. 26.	*F. J. H. J.*
T. Instabilis		April 6.	*F. F. B.*
* Hadena Dentina		June 15.	*A. C. H.*
Phlogophora Meticulosa		May 18.	*F. J. C. B.*
Abrostola Urticæ		June 23	*H. E. B.*
Plusia Gamma		May 11.	*F. J. H. J.*
Euclida Mi		May 18.	*L. H. Y.*
Phytometra Ænea		June 8.	*A. C. H.*
	GEOMETRINA.		
Rumia Cratægata		May 6.	*R. P.*
Selenia Illunaria		April 12.	*H. M. H.*
Amphidasis Prodromaria		April 2.	*F. F. B.*
Hemerophila Abruptaria		May 3.	*E. H. D.*

	Date.	Captor.
Iodis Lactearia	May 29.	*F.J.H.J.—H.M.H.*
Ephyra Punctaria	June 11.	*F. J. H. J.*
Cabera Pusaria	May 23.	*F. J. C. B.*
Corycia Punctata	May 4.	*F. J. H. J.*
C. Taminata	May 13.	*F. J. H. J.*
Lozogramma Petraria	May 7.	*H. G.*
Fidonia Atomaria	May 30.	*J. W. P.*
Minoa Euphorbiata	May 31.	*F. J. H. J.*
Ligdia Adustata	June 22.	*F. J. H. J.*
Lomaspilis Marginata	May 8.	*A.C.H.*
Hibernia Rupicapraria	Feb. 5.	*C. M. B.*
Emmelesia Alchemillata	June 10.	*F. J. H. J.*
Larentia Miaria	May 28.	*F.J.H.J.—A.C.H.*
* Eupithecia Venosata	June 22.	*F. J. H. J.*
* E. Castigata	May 28.	*F. J. H. J.*
Melanthia Ocellata	May 11.	*F. J.H.J.—A.C.H.*
Melanippe Biriviata	May 7.	*F. J. H. J.*
M. Montanata	May 26.	*A. C. H.—W. W.*
M. Fluctuata	April 28.	*T. A. P.*
Anticlea Derivata	About May 6.	*A. C. H.*
* A. Rubidata	June 9.	*F. J. H. J.*
Coremia Propugnata	May 28.	*F. J. H. J.*
C. Ferrugaria	May 4.	*A. C. H.*
Camptogramma Bilineata...	June 14.	*A.C.H.—F.J.H.J.*
Scotosia Dubitata	May 12.	*F. J. H. J.*
Cidaria Corylata...	June 8.	*F. J. H. J.*
C. Russata	May 31.	*A. C. H.*
Odezia Chœrophyllata	June 8.	*M. H. S.*
PYRALIDINA.		
Hypena Proboscidalis	June 20.	*F. J. H. J.*
Pyrausta Ostrinalis	June 10.	*F. J. H. J.*
Herbula Cespitalis	May 6.	*A. C. H.—H. M. H.*
* Hydrocampa Nymphæata	June 21.	*M. H. S.*
Botys Pandalis	June 15.	*F. J. H. J.*
B. Fuscalis	June 11.	*H. M. H.*
B. Urticata...	June 8.	*F. J. H. J.*
Scopula Olivalis...	June 22.	*F. J. C. B.*
* Stenopteryx Hybridalis...	May 6.	*A. C. H.—H. M. H.*
Simaethis Fabriciana	May 6.	*A. C. H.—H. M. H*
* Eudorea Angustea...	Feb. 23. H.	*A. C. H.*

	Date.	Captor.
E. Pyralella...	June 3.	*F. J. H. J.*
Crambus Pascuellus	June 9.	*F.J.H.J.—H.M.H.*
C. Hortuellus	June 22.	
PTEROPHORINA.		
Pterophorus Pterodactylus		*H. M. H.*
* P. Microdactylus	June 20.	*F. J. H. J.*
P. Galactodactylus ... ... Pupa taken.	June 15.	
Alucita Polydactyla	June 20.	*T. A. P.*

BOTANICAL NOTICES.

As usual "By" indicates that the plant had apparently been in flower a day or two before discovered; and an asterisk (*) that the specimen observed was a cultivated one.

Names of those whose initials appear in the following List:—

M. O. A.	M. O. Alison
H. R. A.	H. R. Armstrong.
F. F. B.	F. F. Back.
C. St. J. B.	C. St. J. Beauclerk.
H. E. B.	Rev. H. E. Booth.
C. M. B.	C. M. Bull, Esq.
L. C. C.	L. C. Calley.
S. W. C.	S. W. Cameron.
E. H. C.	E. H. Carr.
S. F. C.	S. F. Chichester.
T. W. D.	T. W. Davies.
H. S. D.	H. S. Dickinson.
T. D.....	T. Dudding.
W. F.	W. Fergus, Esq., M.D.
C. R. F.	C. R. Few.
R. M. B. G.....	R. M. B. Glasse.
G. G.	G. Gurney.
F. W. H.	F. W. Head.
A. H.	A. Herklots.
J. E. H.	J. E. Hilliard.
A. C. H.	A. C. Hilton.

H. M. H.	H. M. Hilton.
A. P. H.	A. P. Hockin.
F. J. H. J.	F. J. H. Jenkinson.
J. H. J.	J. H. Johnson.
L. C. L.	L. C. Leach.
F. E. L.	F. E. Lear.
G. A. L.	G. A. Lefroy.
J. A. L.	J. A. Lefroy.
T. L.....	T. Lister.
T. E. M.	T. E. Maclean.
P. T. M.	P. T. Macquoid.
F. P. M.	F. P. Mansfield.
W. E. M.	W. E. Mullins, Esq.
J. C. P.	J. C. Palmer.
J. W. P.	J. W. Parrington.
R. P.....	R. Phayre.
G. P.....	G. Podmore.
J. J. P.....	Rev. J. J. Pulleine.
W. D. P.	W. D. Pulling.
B. W. R.	B. W. Repton.
A. H. B. R.	A. H. B. Reynardson.
G. F. R.	G. F. Ruck.
R. A. S.	R. A. Simpson.
H. T. S.	H. T. Stainton, Esq., F.R.S.
E. im T.	E. im Thurn.
P. T.	P. Thursby.
T. T.....	T. Tilleard.
L. H. Y.	L. H. Young.

		1867.	1866.	
Thalictrum				
flavum	Meadow Rue	Bud June 21	...	E. im T.
Anemone				
nemorosa ...	Wood Anemone ...	Feb. 20	March 18	H. E. B.
appennina ...	Blue Anemone ...	By April 12	April 1	...
*pulsatilla ...	Pasque Flower ...	May 7	...	...
* hepatica ...	Hepatica blue ...	Feb. 7	...	W. F.
	,, red	Feb. 9	...	W. F.
Ranunculus				
heterophyllus	Water Crowfoot...	April 19	April 18	H. M. H.

		1867.	1866.	
peltatus	Ditto	Full fl My.	15 Before May 1	H. M. H.
ficaria	Lesser Celandine	Feb. 9	Feb. 10	G. F. R.
auricomus ...	Goldilocks	April 19	April 16	G. F. R. & J. W. P.
acris.....	Upright Crowfoot	April 23	May 9	
repens	Creeping ditto ...	April 29	March 17 May 3	G. F. R. & J. W. P
bulbosus	Buttercup	April 17	April 17	S. F. C.
arvensis	Corn Crowfoot ...	By June 10	May 3	J. C. P.
Caltha				
* palustris ...	Marsh Marigold...	Feb. 27	March 21	E. im T. & J. C. P.
Trollius				
Europæus ...	Globe Flower.....	May 7	May 22	...
Eranthis				
* hyemalis ...	Winter Aconite ...	Feb. 1	going off Feb. 10	...
Helleborus				
viridis	Green Hellebore	By April 3	full fl. Apl.18	Mrs. Blake
Aquilegia				
* vulgaris ...	Columbine	May 7	By May 12	...
Berberis				
vulgaris	Berberry	May 13	Bud May 13	G. F. R. & J. W. P.
* fascicularis		March 27	March 18	F. P. M. & T. W. D.
Papaver				
rhœas	Common Poppy...	June 16	May 30	H. T. S.
Meconopsis				
* cambrica ...	Yellow Poppy ...	May 9	May 7	
Chelidonium				
majus	Greater Celandine	May 7	May 1	T. L.
Corydalis				
* solida	Solid Corydal.....	March 16	March 29	
* tuberosa ...	Hollow Corydal...	Full fl. Apl. 16		
Fumaria				
officinalis.....	Fumitory	By May 26	April 26	B. W. R.
Dielytra				
* spectabilis	Bleeding Heart ...	April 29	April 26	
Cheiranthus				
* cheiri	Wallflower	April 7	Feb. 10 April 10	

		1867.	1866.	
Nasturtium officinale	Watercress	June 5	June 6	J. W. P.
Barbarea vulgaris	Yellow Rocket ...	May 10	May 16	J. W. P. & G. F. R.
Arabis hirsuta.....	Hairy Rock Cress	April 25	April 12	J. C. P. & E. im T.
Cardamine hirsuta.....	Hairy Bitter Cress	By Feb. 19	By Feb. 10	
pratensis	Cuckoo Flower ...	April 18	April 22	R. M. B. G. & T. T.
Sisymbrium officinale	Hedge Mustard	June 18	June 10	J. W. P.
Alliaria officinalis.....	Garlick Hedge Mustard	April 23	April 23	J. W. P.
Brassica campestris ...	Navew.....	April 19	Feb. 17	J. C. P.
Lunaria * biennis	Honesty	April 19	April 13	
Sinapis arvensis.....	Charlock	May 6	April 25	A. C. H. & H. M. H.
Aubrietia *		April 1		
Draba verna	Whitlow-grass ...	March 4	Fl. & seed Mar. 10	H. S. D. & T. D.
Armoracia * rusticana ...	Horse Radish.....	June 5	...	J. W. P.
Lepidium campestre ...	Pepper-wort	April 21	Bud Apl. 30	J. C. P. & E. im T.
Capsella bursa-pastoris	Shepherd's Purse	Feb. 14 March 31	April 16	T. E. M. E. im T.
Isatis * tinctoria ...	Woad	May 8	May 7	
Reseda lutea.....	Wild Mignonette	By June 10	June 9	H. M. H.
Helianthemum vulgare	Rock Rose	June 3	May 22	F. W. H.

		1867.	1866.	
Viola				
odorata.....	Sweet Violet	Feb. 23	Feb. 28	F. F. B.
hirta.....	Hairy Violet	April 6	March 23	
Reichenbachiana	Wood Violet	Full fl. Apl 17	April 11	
Riviniana.....	Ditto	April 8	April 11	Mrs. Blake
tricolor.....	Pansy	Full fl. Apl. 21	May 25	J. C. P. & E. im T.
(var) arvensis	Ditto	March 29	April 17	F. J. H. J.
Polygala				
vulgaris	Milkwort	May 4	May 7	E. im T.
Dianthus				
* cæsius ...	Cheddar Pink ...	June 6	June 9	E. im T.
Silene				
inflata	Bladder Campion	June 10	June 4	
Lychnis				
flos-cuculi ...	Ragged Robin ...	May 23	By June 7	J.W.P.&A.H.
vespertina ...	White Campion...	May 16	May 28	J. C. P. & E. im T.
diurna	Red Campion.....	May 4	May 8	E. im T.
Sagina				
procumbens...	Pearl-wort	May 11		G. F. R.
Arenaria				
trinervis	Sand-wort	May 3	April 30	A. C. H. & H. M. H.
serpyllifolia...	Thyme-leaved do.	Fl. & seed June 22	May 26	E. im T.
Stellaria				
media	Chickweed	By Feb. 11	Feb. 18	J. J. P.
Holostea	Greater Stitchwort	April 19	April 12	G. F. R. & J. W. P.
graminea	Grassy ditto	June 15	Full fl. Ju. 23	A. P. H. & H. W. H.
Cerastium				
glomeratum	Mouse-ear Chickweed	March 29	April 16	J. W. P.
Malva				
sylvestris ...	Mallow	June 9	June 19	H. M. H.
rotundifolia...	Dwarf ditto	June 9		P. T.
Tilia				
parvifolia.....	Lime Tree	not by Ju. 26		
Hypericum				
* calycinum		Bud June 16		E. im T.

		1867.	1866.	
perforatum ...	St. John's Wort...	Full budJu.19	Not by Jly.1	J. W. P. & G. F. R.
Acer				
campestre ...	Field Maple	April 28	May 6	E. im T.
Pseudo-platanus	Sycamore	May 3	April 27	G. F. R. & J. W. P.
Æsculus				
Hippocastanum	Horse Chestnut...	April 27	May 5	J. W. P.
Geranium				
* Phæum	Dusky Crane's-Bill	May 4	May 12	
* sylvaticum	Wood ditto	May 14	By May 31	
pratense	Meadow ditto.....	May 29	June 13	M. O. A.
* Sanguineum	Bloody ditto	June 20	June 9	
dissectum ...	Cut-leaved ditto...	By June 2	May 29	J. C. P. & E. im T.
rotundifolium	Round-leaved do.	By June 6	May 12	
molle	Dove's Foot	May 1	April 28	J. C. P. & E. im T.
lucidum ...	Shining Crane's-Bill	May 3	May 2	G. F. R.
Robertianum	Herb Robert	May 1	April 30	A. C. H. & H. M. H.
Linum				
Catharticum	Purging Flax.....	May 18	Full fl.June13	J. W.P.&G.F. R.
Oxalis				
acetosella ...	Wood Sorrel	April 13	Full fl. Ap. 23	J. C. P.
Euonymus				
Europæus ...	Spindle	May 19	May 29	G. F. R.
Staphyllea				
* pinnata ...	Bladder-nut	by May 4	May 8	
Rhamnus				
catharticus ...	Buckthorn	June 3		F. W. H.
Ulex				
Europæus ...	Furze	Feb. 11	by Feb. 25	
Genista				
Anglica	Petty Whin	just outMay18	...	J. J. .P
Sarothamnus				
scoparius ...	Broom	May 23	full fl. May 5	H. M. H.
Medicago				
lupulina	Black Medick.....	May 6	May 1	H.M.H. & A. C. H.

		1867.	1866.	
Trifolium				
pratense	Purple Clover.....	May 8	April 30	E. im T.
repens	Dutch Clover	May 15	May 23	G. F. R.
minus	Lesser Hop Trefoil	May 15	by May 23	J. J. P.
* incarnatum	Scarlet clover ...	nearly out May 29		J. W. P.
Lotus				
corniculatus	Bird's Foot	nearly out May 16		J. C. P. & E. im T.
Anthyllis				
vulneraria ...	Ladies' Fingers ...	May 15	May 21	J.W.P.& A.H.
Vicia				
hirsuta	Hairy Tare	May 23	fl. & seed June 3	G. F. R.
tetrasperma	Slender Tare	by June 12		H. M. H.
sylvatica	Wood Vetch	June 10		J. C. P.
sepium	Bush Vetch.....	May 5	April 27	A. H. B. R.
sativa	Common Vetch ...	June 1		J. W. P.
Lathyrus				
pratensis	Everlasting Tare	June 10		E. im T.
macrorhizus	Tuberous Vetch...	April 22	April 24	A.C.H.&H.M.H.
Hippocrepis				
comosa	Horse-shoe Vetch	May 29	May 29	J.W.P.&L.H.Y
Onobrychis				
sativa	Cock's Head	May 31	May 28	G. F. R.
Cytisus				
*Laburnum	Laburnum	May 8	May 15	E. im T.
Prunus				
spinosa	Sloe	April 7	April 8	W.D.P.; J.W. P.&G.F.R.
insititia	Bullace	April 8	March 28	G. F. R. & E. im T.
domestica	Wild Plum	April 17		E. im T.
Avium	Cherry Tree	April 19	April 18	J. J. P.
*Padus	Bird Cherry	May 8	...	
Spiræa				
ulmaria	Meadow Sweet ...	June 23		J. W. P.
Sanguisorba				
officinalis ...	Great Burnet	bud Ap. 28		J. W. P. and G. F. R.

		1867.	1866.	
Poterium				
Sanguisorba	Small Burnet ...	May 9	May 3	J. W. P. and G. F. R.
Agrimonia				
eupatoria ...	Agrimony	bud June 10		J. W. P.
Alchemilla				
vulgaris	Lady's Mantle ...	May 1	May 5	A. C. H. and H. M. H.
arvensis	Parsley Piert	April 11	March 17	J. W. P. and G. F. R.
Sibbaldia				
*procumbens	Sibbaldia.....	May 9	May 3	
Potentilla				
anserina	Silver-weed.....	May 16	May 21	J. C. P. and E. im T.
Tormentilla..	Tormentil	May 8	May 9	J. C. P.
fragariastrum	Barren Strawberry	Feb. 14	Feb. 17	H. M. H.; T. E. M. & E. im T.
Fragaria				
vesca	Strawberry	April 17	April 25	
Rubus				
Idæus	Raspberry	bud Ap. 21	May 10	G. F. R.
cæsius	Dewberry	May 18	June 1	G. F. R. and J. W. P.
	Bramble	June 15		A. P. H.
Geum				
urbanum ...	Avens	April 26	by May 4	
rivale	Water Avens	April 12	April 1	
Rosa				
canina	Dog Rose.....	June 1	...	J. W. P. and L. H. Y.
Cratægus				
oxyacantha	Hawthorn	May 7	May 14	J. W. P.
Pyrus				
malus	Crab Apple.....	May 7	May 9	J. W. P.
*aucuparia ...	Mountain Ash.....	May 7	May 20	J. W. P. and G. F. R.
*Japonica		April 1	Feb. 10	
*	Apple	April 28	April 27	H. E. B.

		1867.	1866.	
*	Apricot	March 31	March 31	H. E. B.
*	Damson	April 21		J. W. P.
*	Peach	March 27	March 21	H. E. B.
*	Pear.....	Ap. 7, Ap. 21	April 20	T.D.; H.E.B.
*	Plum	March 31	April 1	H. E. B.
Epilobium				
montanum ...	Broad Willow Herb	June 14		
Montia				
fontana	Water Blinks	full fl.May 18	seed May 23	
Bryonia				
dioica	Red-berried Bryony	June 7		J. W. P.
Sedum				
*Rhodiola ...	Rose-root	May 4	May 7	
acre	Wall-pepper	June 15		J. W. P. and G. F. R.
Ribes				
grossularia ...	Gooseberry	April 7	April 1	J. W. P. and G. F. R.
rubrum	Red Currant	by April 8	April 9-14	W. D. P.
*sanguineum	Scarlet Ribes	March 29	April 1-8	
aureum	Golden ditto	April 26	by April 18	J. W. P. and E. H. C.
Saxifraga				
*hirsuta	Hairy Saxifrage...	May 7	...	
tridactylites	Rue-leaved ditto	April 11	April 12	G. F. R. & J. W. P.
granulata ...	Meadow ditto	May 4	May 8	E. im T.
Philadelphus				
*Coronarius...	Syringa	June 8		J. W. P.
Sanicula				
Europæa ...	Sanicle.....	May 9	May 7	J. W. P. and G. F. R.
Helosciadium				
inundatum ...	Least Marsh-wort	by June 20		J. W. P and L. H. Y.
Ægopodium				
podagraria ...	Goutweed	June 5		J. W. P.
Bunium				
flexuosum ...	Pignut	May 23	May 22	J. C. P. and E. im T.
Œnanthe				
crocata ...	Water Dropwort	just in fl. June 8		H. M. H.

		1867.	1866.	
Æthusa				
cynapium ...	Fool's Parsley ...	May 25	...	J. C. P.
Meum				
*Athamanticum	Bald-Money	May 20	...	
Angelica				
sylvestris ...	Wild Angelica ...	bud May 16	...	E. im. T. & J. C. P.
Heracleum				
sphondylium	Hogweed	May 11	June 4	G. F. R.
Daucus				
carota	Carrot	June 16	...	E. im T.
Torilis				
Anthriscus ...	Hedge Parsley ...	bud June 14	...	G. F. R.
nodosa	Knotted ditto.....	by June 18		J. W. P. & G. F. R.
Scandix				
pecten	Venus' Comb	April 23	May 9	E. im. T.
Anthriscus				
sylvestris ...	Wild Chervil	April 13	April 13	E. im T.
Chærophyllum				
temulum ...	Rough Chervil ...	May 25	bud June 11	E. im T.
Conium				
maculatum ...	Hemlock	bud June 6		J. W. P. & G. F. R.
Adoxa				
moschatellina	Moschatel	March 9	March 30	F. J. H. J.
Cornus				
sanguinea ...	Dogwood.....	June 16		H. T. S.
* mascula ...	Cornel Cherry ...	Feb. 22.	by Feb. 22	
Sambucus				
nigra	Elder	May 23	June 2	E. im T. & J. C. P.
Viburnum				
lantana	Wayfaring Tree...	May 4	May 5	E. im T.
opulus	Guelder Rose	* June 1 June 8		
Lonicera				
* caprifolium	Perfoliate Honeysuckle	May 11	May 20	T. L.
Periclymenum	Honeysuckle	June 15		F. J. H. J.
* pyrenaica		April 28		H. E. B.
Symphoricarpos				
* racemosus	Snowberry	June 4		E. im. T.

		1867.	1866.	
Sherardia				
arvensis	Blue Sherardia ...	May 15	May 4	G. F. R.
Asperula				
cynanchica ...	Quinancy-wort ...	full bud June 18		G. F. R.
odorata	Sweet Woodruff...	May 4	May 7	
Galium				
cruciatum ...	Cross-wort	May 10	April 27	E. im T. & J. C. P.
aparine	Cleavers	May 9	May 10	G. F. R. & J. W. P.
mollugo	Bastard Madder...	June 14		
verum	Yellow Bedstraw	bud June 15		E. im T.
saxatile	Heath do.	bud May 27		J. C. P.
Centranthus				
*ruber	Spur Valerian ...	May 25	May 23	E. im T.
Valeriana				
officinalis ...	Valerian	full bud June 8		
dioica	Marsh do.	May 8 Ramsbury May 11 (Marlboro)	May 3	J. W. P. & L. H. Y. E. im T. & J. C. P.
Valerianella				
olitoria	Corn Salad	March 23	April 27	
Knautia				
arvensis	Field Scabious	...June 15		
Scabiosa				
columbaria ...	Small do.	June 20		J. W. P. and L. H. Y.
Petasites				
vulgaris	Butter-bur	Feb. 28	March 9	F. F. B.
Tussilago				
farfara.....	Coltsfoot.....	Feb. 11	Feb. 23	J. J. P.
Achillea				
millefolium...	Yarrow	June 14		
Anthemis				
arvensis	Corn Chamomile	by June 7		J. W. P.
Chrysanthemum				
leucanthemum	Ox-Eye	May 16	May 20	E. im T. and J. C. P.
Doronicum				
*pardalianches	Leopard's-bane...	May 4	May 2	

		1867.	1866.	
Senecio aquaticus ...	Marsh Ragwort...	June 16		G. F. R.
campestris ...	Field Fleawort ...	full bud May 13	bud May 21	J. J. P.
Centaurea scabiosa	Greater Knapweed	bud June 10		J. W. P.
Carduus nutans.....	Musk Thistle	June 8		E. im T.
crispus.....	Welted Thistle ...	May 26	May 21	J. W. P. and G. F. R.
palustris	Marsh do.	June 15		E. im T.
Lapsana communis ...	Nipplewort.....	June 24		E. im T.
Hypochœris radicata	Long-rooted Cat's-ear	June 16		E. im T.
Apargia hispida	Rough Hawkbit...	June 2		J. C. P. and E. im T.
Tragopogon minor	Goat's-beard	by June 7		J. C. P.
Leontodon taraxacum ...	Dandelion	Feb. 7	Feb. 17	
Sonchus asper	Sowthistle	June 7		J. W. P.
Crepis virens	Smooth Hawks-beard	June 7		J. C. P.
biennis.....	Rough do.	by June 10		J. C. P.
Hieracium pilosella	Mouse-ear-Hawk-weed	June 8		E. im T.
Campanula * glomerata	Clustered Bell Flower.....	June 4		E. im T.
Ilex aquifolium ...	Holly	May 11	May 24	J. C. P. and E. im T.
Ligustrum vulgare	Privet	bud June 16		J. W. P.
Fraxinus excelsior	Ash	April 28	by April 25	H. R. A.
Syringa * vulgaris.....	Lilac	May 3	May 7	J. W. P. and G. F. R.

		1867.	1866.	
*persica	Persian Lilac	May 6		J. W. P.
Vinca minor	Periwinkle	* Feb. 6	{in flower March 3	
Gentiana amarella	Felwort	June 9		H. M. H.
* acaulis	Stemless Gentian	April 12	by April 3	
Menyanthes trifoliata	Buckbean	by May 7	by June 6	C. St. J. B.
Cynoglossum officinale	Hound's Tongue	May 29	June 6	H. M. H.
Symphytum officinale ...	Comfrey	April 29	April 28	J. J. P.
asperrimum...		by May 30		E. im T. and J. C. P.
Pulmonaria * officinalis...	Lungwort	{full flower April 23	April 8	
Lithospermum arvense	Groundsell	May 9	April 23	A. P. H. and J. E. H.
Myosotis arvensis	Field Scorpion-grass	May 6	April 16	H. M. H. and A. C. H.
collina	Early Scorpion-grass	April 14	by April 23	G. F. R.
versicolor ...	Yellow & blue do.	by May 19	fl. & seed May 22	G. F. R.
Solanum Dulcamara ...	Bitter-sweet	June 8		J. C. Boles
Atropa *Belladonna	Deadly Nightshade	May 28	June 9	
Orobanche minor	Lesser Broom-rape	June 14		H. T. S.
Lathræa Squamaria ...	Toothwort	April 10	March 30	B. W. R. and S. F. C.
Digitalis *purpurea ...	Foxglove	June 21		
Linaria Cymbalaria...	Ivy-leaved Toadflax	May 8	April 26	E. im T.
Scrophularia nodosa.....	Knotted Figwort	June 1		P. T. M.
*vernalis.....	Yellow ditto	April 1	April 1	

		1867.	1866.	
Melampyrum pratense	Cow-wheat	June 7		Mrs. Blake
Pedicularis sylvatica	Red Rattle	fully out May 6	April 30	G.P.&R.A.S
palustris	Marsh ditto	by June 20		J.C.P.&G.G.
Rhinanthus Crista-galli ...	Yellow-rattle	May 26	May 26	J. W. P. and G. F. R.
Veronica Beccabunga	Brooklime	May 27	June 6	G. F. R.
Chamædrys	Germander Speedwell	March 31 May 14	April 28	E. im T.
Serpyllifolia	Thyme-leaved do.	full flower May 6	May 7	Westmacott and Wood
arvensis	Wall ditto	April 23	May 15	J. C. P. and E. im T.
Buxbaumii ...	Buxbaum's ditto	seed Feb. 11, fl. April 7	Feb. 21	G. F. R. & J. W. P.
hederifolia ...	Ivy-leaved ditto	Feb. 14	Feb. 20	T. E. M. & H. M. H.
Thymus serpyllum ...	Wild Thyme	May 29	June 4	J. W. P. & L. H. Y.
Nepeta Glechoma ...	Ground Ivy	bud Mar. 26	Mar. 24	E. im T.
Lamium purpureum ..	Red Dead-nettle	Feb. 9	all the year	M. O. A.
album	White ditto... ...	Feb. 17	Feb.26,Ap.1	F. F. B.
*maculatum	Spotted ditto ...	by April 18	by April 1	
Galeobdolon	Archangel	April 27	April 30	J. J. P.
Stachys sylvatica	Hedge Woundwort	June 14		G. F. R.
Ballota fœtida	Horehound	bud June 16		G. F. R.
Ajuga reptans	Bugle	May 4	May 5	E. im T.
Primula vulgaris	Primrose.....	by Feb. 11	a few in Feb.	M. O. A.
veris.....	Cowslip	March 30	April 5	C. M. B.
Lysimachia nemorum	Wood Pimpernel	May 4		J. J. P.

		1867.	1866.	
Dodecatheon				
*meadea.....	American Cowslip	May 1		
Plantago				
lanceolata ...	Ribwort	April 28	April 23	G. F. R. & J. W. P.
media	Lamb's Tongue ...	bud May 15		G. F. R.
major	Waybread	bud June 19		E. im T.
Rumex				
conglomeratus	Sharp Dock	not nearly out Ju. 14		
obtusifolius	Broad-leaved ditto	not quite out Ju. 15		
crispus	Curled ditto...	barely out June 14		
acetosa.....	Common Sorrel...	May 25	April 30	E. im T.
acetosella	Sheep's Sorrel ...	June 10		
Polygonum				
Bistorta	Snakeweed	about May 19		R. P.
Daphne				
*mezereum	Common Mezereum	Feb. 6	in fl. Apl. 12	
Laureola.....	Spurge Laurel ...	Feb. 25		
Asarum				
*Europæum	Asarabacca.....	April 1	April 1	
Buxus				
sempervirens	Box	April 1	March 25	
Euphorbia				
amygdaloides	Wood Spurge.....	April 26	April 30	J. C. P. & E. im T.
Mercurialis				
perennis	Dog's Mercury ...	barren Feb. 15, fertile Feb. 22	Feb. 18 Feb. 26	T. E. M. & S. W. C.
Urtica				
urens	small Nettle	bud May 7		G. F. R.
dioica	common Nettle ...	June 10		
Ulmus				
suberosa	common Elm	March 31	seed April 27	E. im T.
montana	Wych Elm	March 26	March 3	
Salix				
caprea.....	Great Sallow	barren Feb. 25 fertile Mar. 5	March 11	R.C.L.; R.P.; R.M.B.G.

		1867.	1866.	
Populus				
nigra	Black Poplar	Feb. 17	April 18	J. W. P. & E. im T.
fastigiata.....	Lombardy ditto...	leaf May 4		J. W. P. & G. F. R.
Betula				
glutinosa.....	Birch	April 17	May 2	E. im T.
Fagus				
sylvatica.....	Beech	leaf April 25		J. C. P. & E. im T.
Castanea				
vulgaris	Sweet Chestnut...	leaf May 20		J. W. P.
Quercus				
Robur	Oak	May 6	nearly out May 2	J. C. P. & E. im T.
		fertile May 9		J. W. P. & G. F. R.
Corylus				
avellana	Hazel	barren Feb. 9	Feb. 12	M. O. A.
		fertile Feb. 15	Feb. 21	M. O. A.
Juglans				
regia	Walnut	fertile open, barren unopened My. 20	May 1	J. W. P.
Carpinus				
Betulus.....	Hornbeam	April 9	by May 7	E. im T.
Taxus				
baccata	Yew.....	Feb. 22	Feb. 21	
Pinus				
sylvestris	Scotch Fir	just in bud April 23		J. W. P.
Larix				
Europæa.....	Larch	barren Mar. 29 fertile Apl. 3	by April 1	J. W. P. & E. im T.
Paris				
* quadrifolia	Herb Paris	April 30	May 2	
Tamus				
communis ...	Black Bryony.....	June 13		H. M. H.
Orchis				
morio	Green-Winged Orchis	May 6	May 5	J. C. P.; E. im T.; H. M. H.

		1867.	1866.	
mascula	Early Purple Orchis	April 19	April 24	F. E. L.
ustulata	Dwarf ditto.....	May 29	May 29	J. W. P.
maculata.....	Spotted Hand do.	*June 7		H. M. H.
		June 11		
latifolia	Marsh ditto	by June 20		J.C.P.&G.G.
Gymnadenia				
conopsea.....	Fragrant ditto ...	June 18		G. F. B.
Habenaria				
viridis	Frog ditto	full bud		J. C. P. &
		May 23		E. im T.
		by June 23		J. J. P.
chlorantha ...	Butterfly ditto ...	June 7		Mrs. Blake
		*June 3		
Listera				
ovata	Tway-blade	* May 8	May 21	J. W. P. &
		May 15		A. H.
Neottia				
nidus-avis ...	Bird's-nest Orchis	May 9	May 29	J. W. P. &
				G. F. B.
Iris				
Pseudacorus	Yellow Iris	by June 10		E. im T.
* germanica	Blue Iris	June 11		E. im T.
Crocus				
* vernus	Yellow Crocus ...	by Feb. 6	full fl. Feb.10	
Narcissus				
pseudo-narcissus	Daffodil	by Feb. 23	March 6	M. O. A.
Lencojum				
* Æstivum...	Summer Snowflake	April 23	April 10	
Galanthus				
nivalis	Snowdrop	Jan. 31	full fl. Feb.10	
Convallaria				
* majalis.....	Lily of the Valley	May 7	May 19	E. im T.
* bifolia	Twin-leaved ditto	May 30		
Polygonatum				
multiflorum	Solomon's Seal ..	May 13	May 21	E. im T.
Tulipa				
* sylvestris...	Wild tulip	* April 16	full fl. Apl. 23	J. C. P. & E.
		by April 22		im T.
Fritillaria				
* meleagris...	Snake's Head ...	April 16	April 3	
*Imperialis...	Crown Imperial ...	April 7	April 10	

		1867.	1866.	
Ornithogalum				
* umbellatum	Star of Bethlehem	young bud April 19		
Scilla				
* bifolia	Twin-leaved Squill	Feb. 25	Feb. 10	
* sibirica.....	Siberian ditto	March 24	by Feb 10	
* cernua	Nodding ditto	April 21		
Allium				
*Schœnoprasum	Chive Garlic ...	June 3		
ursinum	Ramsons	by May 10		J. C. P. and E. im T.
* molle		May 3	May 12	
Endymion				
nutans	Blue-bell	April 9	April 13	H. M. H.
Muscari				
* racemosus	Grape hyacinth ...	by April 12	April 1	
Erythronium				
* Dens-canis	Dog's Tooth Violet	March 24		
Juncus				
effusus	Soft Rush	June 20		J. W. P. and L. H. Y.
conglomeratus	Common Rush ...	full bud June 14		
Luzula				
pilosa	Hairy Wood Rush	April 8	April 4	Mrs. Blake
campestris ...	Field Wood Rush	April 13	April 30	G F. R.
Arum				
maculatum ...	Cuckoo-pint	April 23	April 19	H. M. H.
Eleocharis				
palustris	CreepingSpike-rush	June 12		G. F. R.
Carex				
divulsa	Grey Sedge	May 28		E. im T.
vulpina	Great Rough Sedge	May 10	May 9	J. C. P. and E. im T.
* pendula.....	Pendulous Sedge	full bud Ap. 27		
præcox	Vernal Sedge.....	April 23	April 22	J. W. P. and G. F. R.
pilulifera ...	Round-headed do.	May 27		E. im T.
glauca	Glaucous do. ...	May 4		E. im T.
sylvatica.....	Wood do.	May 15	May 9	J. W. P. and A. H.

		1867.	1866.	
hirta	Hairy do.	June 12		G. F. R.
paludosa	River do.	by May 8	April 21	J. W. P. and L. H. Y.
riparia.....	Great River do. ...	by May 8	April 13	J. W. P. and L. H. Y.
Phalaris				
arundinacea	Great Reed Grass	June 12		G. F. R.
Anthoxanthum				
odoratum ...	Sweet Vernal grass	April 26	May 5	G. F. R.
Phleum				
pratense	Timothy Grass ...	June 14		H. T. S.
Alopecurus				
pratensis.....	Fox-tail Grass ...	April 18	April 30	
geniculatus...	Floating ditto	May 26	May 29	J. W. P. & G. F. R.
agrestis	Black Grass	June 5		J. C. P. & E. im T.
Milium				
effusum	Millet	May 9	not out May 10	J. W. P. & G. F. R.
Holcus				
mollis	Soft Grass	May 15		G. F. R.
Aira				
cæspitosa ...	Hair Grass	June 20		J. W. P. & L. H. Y.
caryophyllea	Silvery ditto	June 8		E. im T.
Trisetum				
flavescens ...	Yellow Oat-grass	June 8		
Avena				
pratensis	Narrow-leaved do.	June 14		
pubescens ...	Downy ditto	May 17		
Arrhenatherum				
avenaceum ...	Oat Grass	June 8		
Kœleria				
cristata	Crested Hair-grass	June 10		E. im T.
Melica				
uniflora	Melic	May 10	April 27	J.C.P.&E.imT.
Poa				
annua	Annual Meadow-grass	By Feb. 19	March 3	

		1867.	1866.	
nemoralis ...	Wood ditto	May 20		
trivialis	Rough ditto	By June 4		E. im T.
pratensis.....	Common ditto ...	May 7	May 6	
compressa ...	Flat-stemmed ditto	May 17		
Glyceria				
fluitans	Flote-grass	June 23		J.A.L.&C.R.F
plicata.....		June 5		J. W. P.
Briza				
media	Quaking-grass ...	May 18	June 2	H. M. H.
Cynosurus				
cristatus	Dog's-tail Grass...	June 8		J. C. P.
Dactylis				
glomerata ...	Cock's-foot Grass	May 16	May 15	J.W.P.&L.H.Y
Festuca				
ovina	Sheep's Fescue ...	May 18	May 15	
rubra	Creeping Fescue	May 17		
Bromus				
erectus	Upright Brome-grass	May 19		G. F. R.
asper	Hairy ditto.....	June 20		
sterilis.....	Barren ditto	nearly out May 7	by June 28	G. F. R.
Serrafalcus				
commutatus	Tumid Field do...	full fl. Ju. 10		
mollis	Lop-grass	May 2	May 9	G. F. R.
Lolium				
perenne	Rye-grass	May 7	May 4	G. F. R.
Italicum	Italian ditto	full fl. Ju.10		
	Rye	May 11	May 15	J. C. P. and E im T.
	Wheat	June 18		J. W. P.
Equisetum				
arvense	Corn Horsetail ...	fertile Ap.26	April 21	R. M. B. G. & F.J. H. J.
		barren May 7	May 13	G. F. R.
limosum ...	Smooth ditto	May 23		G. F. R.
palustre	Marsh ditto.....	May 23		H. M. H.
Lastrea				
Filix-mas ...	Male Fern	4 ins. high April 22		H. M. H. & A. C. H.
Scolopendrium				
vulgare	Hart's Tongue ...	4 ins. high April 29		H. M. H.

		1867.	1866.	
Pteris aquilina	Brakes.....	3 ins. high April 22		J. J. P.
Botrychium Lunaria	Moonwort	April 19	May 2	J. H. J.
Ophioglossum ... vulgatum ...	Adder's Tongue ...	May 4	April 23	J. J. P.

NEW SPECIES.

Corydalis tuberosa	A specimen in Mr. Brind's garden, said to have been found in West Woods. An escape from some garden, though the plant is very rarely to be met with near Marlborough.
Helosciadium inundatum...	Pond near Ivy's Farm, *J. W. P.* and *L. H. Y.*
Torilis nodosa	On the side of the Bath road, *J.W.P. & G.F.R.*
Pedicularis palustris	Ramsbury, *J. C. P.* and *E. im T.*
Carex hirta	College Bathing place, *G. F. R.* This plant was discovered last year by *G. F. R.*, but could not be sufficiently identified.
Aira Caryophyllea	Marlborough Downs, *E. im T.*
Poa compressa	College Wall. Probably this species.

NEW LOCALITIES.

Thalictrum flavum	Kennet, near bridge at bottom of Granham Hill, *E. im T.*
Viola Reichenbachiana ...	Plentiful on the borders of Fox Wood.
Genista anglica	Near the Obelisk, Savernake Forest, *J. J. P.*
Conium maculatum	Field near Barton House, *G. F R.* and *J. W. P.* Ramsbury, *G. F. R.*
Senecio campestris	Ogbourne Downs, *J. J. P.*
Menyanthes trifoliata ...	Plentiful in the meadow belonging to St. Peter's Rectory, and at Ramsbury, *J. W. P.* and *L. H. Y.*
Orchis latifolia	Ramsbury, plentiful, *J. C. P.* and *G. G.*
Gymnadenia conopsea ...	Row Down, *G. F .R.*
Habenaria viridis	Chiseldon, *J. C. P.* and *E. im T.*, near Savernake Ruins, *J. J. P.*
Carex vulpina	Chiseldon, *E. im T.* and *J. C. P.*
Asplenium adiantum-nigrum	Overton Downs, *J. W. P.*

Botrychium lunaria ... ... Martinsell and Preshute, *L. C. C.* and *P. T.*; White Horse Down, Sergeant Doole's, and Savernake Ruins, *J. J. P.* Savernake Forest Cricket Ground.

The cold JANUARY checked vegetation, so that nothing appeared till quite the end of the month; on the 31st, Snowdrops were only just out.

FEBRUARY was remarkably warm, consequently plants were far more forward than usual. The only real exceptions were the *Hairy Bitter-cress* (9 days) and the *Twin-leaved Squill* (15 days), both of which are generally out in January. The *Siberian Squill*, which is generally in flower early in February, did not flower this year till March 24th; this great difference may have resulted from the bulbs having been transplanted.

The plants which were in flower *earlier* than last year are the *Wood Anemone* (nearly a month), of which several specimens were gathered before the end of the month; *Marsh Marigold* (22 days), at Lockeridge, but only in bud at Marlborough on the 28th; *Shepherd's Purse* (2 months), this was an unusually early specimen, as no more were found for six weeks; *Chickweed* (7 days); *Furze* (14 days, perhaps less); *Butter-bur* (12 days) at Mildenhall, not in flower at Marlborough till Feb. 28th; *Coltsfoot* (12 days); *Dandelion* (10 days); *Buxbaum's Speedwell* (14 days), a plant which seems to live all the winter, and to stand very severe frosts; *Ivy-leaved Speedwell* (6 days); *White Dead-nettle* (9 days), from last year's shoots; *Mezereum* (1 month); *Sallow* (14 days); *Black Poplar* (7 weeks); *Daffodil* (11 days); *Annual Poa Grass* (12 days).

The *Lesser Celandine*, *Sweet Violet*, *Barren Strawberry*, *Cornel Cherry*, *Hazel*, and *Yew*, seem to have flowered at nearly or quite the same time as last year.

The *Dog's Tooth Violet* was nearly out on the 23rd February, but on account of the cold weather, the flower never opened till March 24th.

Both kinds of *Avens* were in flower on the 17th February, and earlier. The flowers were from last year's shoots, which were only killed by the frosts of March.

The following were in bud at the times mentioned, but had not been found in flower by the end of the month.

Hairy Violet	Feb. 21.	...	Mrs. Blake.
Bullace	Feb. 17.	...	F. F. B.
Hawthorn	Feb. 26.	...	J. W. P.
Rue-leaved Saxifrage ...	Feb. 27.	...	G. F. R.
Moschatel	Feb. 28.	...	F. F. B.
Elder	Feb. 17.	...	F. F. B.
Lilac—flower buds appearing	Feb. 28.	...	

Siberian Squill—nearly out	Feb. 24.	...	
Blue Bell—young bud ...	Feb. 21.	...	R. M. B. G.
Grape Hyacinth, buds above ground	Feb. 24.	...	
Dog's-Tooth Violet ...	Feb. 23.	...	
Cuckoo-pint—young spathe	Feb. 9.	...	G. F. R.

The following were showing leaves.

Bramble	young shoots ...	Feb. 26	J. W. P.
Hawthorn	young leaves ...	Feb. 26	J. W. P.
Orpine..	3½ inches high ...	Feb. 22	M. O. A.
Gooseberry	young leaf	Feb. 11	M. O. A.
„	bush green	Feb. 25	J. W. P. & E. im T.
Scarlet Ribes	bud bursting ...	Feb. 22	M. O. A.
Elder	young leaf	Feb. 9	G. F. R.
„	leaves well advanced	Feb. 22	R. M. B. G.
Wayfaring Tree ...	v. young buds ...	Feb. 16	T. E. M.
Perfoliate Honeysuckle	full leaf	Feb. 18	E. im T.
Honeysuckle	v. young leaf ...	Feb. 14	T. E. M. & H. M. H.
Snowberry	buds bursting ...	Feb. 25	H. M. H.
Privet	v. young leaves ...	Feb. 26	G. F. R.
Lilac	buds bursting ...	Feb. 11	
Deadly Nightshade ...	just appearing above ground	Feb. 24	
Early Purple Orchis ...	above ground ...	Feb. 23	M. O. A.

The exceedingly cold weather in MARCH retarded vegetation to a great extent, so that nothing grew till quite the end of the month. Those plants therefore, which do not generally flower till the beginning or end of the month were in bloom about their usual time; such were the *Tuberous Corydal*, *Whitlow-grass*, *Apricot*, *Peach*, *Plum*, *Scarlet Ribes*, *Ground Ivy*, *Common Elm*, and *Larch*.

Those which were in flower earlier than last year were the *Wild Pansy* (19 days); *Mouse-ear* (18 days), from last year's shoots; *Moschatel* (21 days); *Corn Salad* (35 days); *Germander Speedwell* (28 days); and *Cowslip* (6 days). The Corn Salad seems to have flowered when covered with snow; the Germander Speedwell was an unusually early specimen, no other flower being seen till May 4th.

Berberis fuscicularis, *Wych Elm*, and *Siberian Squill* were much behind their usual time. A specimen of what appeared to be Wych Elm was found in flower as early as Feb. 21st, by Mrs. Blake, but the trees generally were only in bud before the cold weather set in, so that when the snow melted the buds were in many cases killed, and consequently but comparatively few trees perfected any seeds.

The *Sallow*, though its barren catkins were in flower in February, did not open its fertile ones till about the 3rd March: young leaves were found on the 27th, by *J. W. P.*

The *Daffodil* was plentiful about the 27th March, though many buds had been nipped by the frost.

The *Shepherd's Purse* was in flower from this year's shoots, not before the 31st March: it had been found in flower last month.

The following were in bud at the times mentioned, but had not been found in flower by the end of the month.

Blue Anemone		March 11	H. E. B.
Wood Violet		March 31	J. W. P.
Bladder-nut		March 2	
Gooseberry		March 29	E. im T.
Red Currant		March 30	W. D. P.
Rue-leaved Saxifrage ...	coloured buds ...	March 6	
Guelder Rose	fl. buds appearing ...	March 3	
Yellow Figwort ...		March 26	
Ground Ivy		March 26	E. im T.
Asarabacca		March 26	
Crown Imperial ...		March 25	
Bluebell		March 31	J. W. P.

The following were showing leaves.

Spindle	leaf buds nearly open	March 22	F. F. B.
Broom	buds bursting ...	March 1	Mrs. Blake.
Dog Rose	shoots 1½ inches long	March 3	G. A. L.
Hawthorn	a few young leaves	March 27	L. C. C. & P. T.
Red Currant	buds bursting ...	March 5	W. D. P.
Wayfaring Tree ...	young leaves ...	March 3	
Snowberry	young leaves ...	March 27	J. W. P.
Sallow	leaves	March 27	J. W. P.
Hazel	v. young leaves ...	March 31	G. F. R.

During the first half of APRIL, vegetation seemed at a stand-still, almost every plant which came into flower during that period being behind its usual time, and but few plants showing either leaf or flower buds till about the 16th.

Those plants which were in flower about their usual times were the *Wallflower, Wood Violet, Sloe, Pear, Red Currant, Rue-leaved Saxifrage, Yellow Figwort, Asarabacca, Larch, Crown Imperial, Blue Bell, Hairy Wood-rush*; but it must be observed that many of these are cultivated plants; in fact a specimen of pear was found in flower as early as April 7, nearly a fortnight before, but no record was kept of the flowering of that plant last year, and it is,

therefore, unfit for comparison; the trees observed last year flowered almost at the same time this year.

No plants were decidedly in flower earlier than last year.

Of those which were much later may be mentioned the *Hairy Violet* (14 days), *Bullace* (11 days), *Parley Piert* (25 days), *Pyrus Japonica* (32 days), *Gooseberry* (6 days), *Toothwort* (11 days), *Box* (6 days), and *Hornbeam* (about 20 days).

During the second half of the month a great change took place, and plants came rapidly into flower—so much so that several were in flower before their usual time.

Those which require especial notice are the *Upright Crowfoot* (16 days), *Creeping Crowfoot* (12 days), *Wild Pansy* (5 weeks), *Pepper-wort* (9 days), *Field Maple* (8 days), *Horse Chestnut* (8 days), *Strawberry* (8 days), *Common Avens* (8 days), *Venus' Comb* (16 days), *Early Scorpion-grass* (7 days), *Wall Speedwell* (22 days), *Birch* (15 days), *Early Purple Orchis* (5 days), *Allium Molle* (9 days); *Field Wood-rush* (17 days); *Sweet Vernal-grass* (9 days); *Foxtail Grass* (12 days), and *Moonwort* (13 days).

The following were in flower at or about the same time as last year. *Water Ranunculus (R. fluitans), Goldilocks, Buttercup, Bleeding Heart, Cuckoo Flower, Garlick Hedge-mustard, Wood Sorrel, Tuberous Vetch, Cherry Tree, Lady's Mantle, Apple, Wild Chervil, Comfrey, Archangel, Wood Spurge, Herb Paris, Cuckoo-pint, Vernal Sedge.*

The following were much later.

Blue Anemone (11 days), *Hairy Rock-cress* (13 days), *Navew* (9 weeks), *Honesty* (6 days), *Stitchwort* (7 days), *Sycomore* (6 days), *Water Avens* (11 days), *Golden Ribes* (8 days), *Ash* (about 6 days), *Stemless Gentian* (9 days), *Lungwort, Spotted Dead-nettle* (18 days), *Ribwort* (5 days), *Summer Snow-flake* (13 days), *Snake's-head* (13 days), *Grape Hyacinth* (11 days), *River Sedge* (about 7 days), *Corn Horse-tail* (5 days).

As a proof of the great difference of temperature between Marlborough and places only a few miles distant, may be mentioned the *Water Ranunculus*, which both in 1866 and 1867 was in full flower at Lockeridge a week before any flowers were observed at Marlborough, and the *Marsh Marigold*, referred to in the notices for February.

The *Corn Horse-tail* was found at Woodborough by W. E. M., on the 23rd April, and had evidently been out for some time as the fertile spike had done flowering and become shrivelled—no fertile fronds were observed near Marlborough till April 26; and the barren fronds did not appear till May 7.

Plums, though mentioned in flower on March 31 (as being the date of the flowering of the tree observed last year) were not generally in flower till April 16.

In bud at the dates mentioned, but not in flower by the end of the month.

Pasque flower		April 19	
Columbine		April 19	
Yellow Poppy		April 26	
Greater Celandine ...		April 17	G. F. R.
Winter-cress		April 17	G. F. R.
Charlock		April 21	E. im T.
Woad		April 19	
Spindle		April 8	
Laburnum		April 19	
Great Burnet		April 28	J.W.P. & G.F.R.
Lady's Mantle		April 17	
Raspberry		April 21	G. F. R.
Hawthorn		April 7	H. R. A.
,, ...	full bud	April 28	J.W.P. & G.F.R.
Crab Apple		April 21	G. F. R.
Mountain Ash		April 16	E. im T.
Red-berried Bryony ...		April 26	A.C.H. & H.M.H.
Rose-root		April 19	
Black Currant		April 26	A.C.H. & H.M.H.
Meadow Saxifrage ...		April 19	
Sanicle	v. young buds ..	April 8	Mrs. Blake.
Dogwood...		April 28	J.W.P. & G.F.R.
Wayfaring Tree... ...	full bud	April 23	
Marsh Valerian	full bud	April 23	
Ox-eye		April 26	G. F. R.
Leopard's-bane	young bud	April 19	
Musk Thistle		April 22	J. W. P.
Holly		April 28	J.WP. & G.F.R.
Ash	stamens appearing ...	April 19	
Bugle		April 22	J.C P. & E. im T.
Common Sorrel		April 28	G.F.R. & J.W.P.
Scotch Fir	just in bud	April 23	J. W. P.
Butterfly Orchis ...	v. young bud ...	April 16	G.F.R & J.W.P.
Tway blade	above ground ...	April 16	G.F.R. & J.W.P.
Solomon's Seal		April 22	G. F. R.
Star of Bethlehem ...	v. young bud ...	April 19	
Allium Molle		April 19	
Pendulous Sedge ...	full bud	April 27	
Glaucous do.		April 22	A.C.H.&.H.M.H.
River Sedge, Great Sedge }	full bud	April 23	

In leaf.			
Berberry	leaf	April 11	J.W.P. & G.F.R.
Lime	young leaves ...	April 12	G. F. R.
Field Maple	leaf	April 17	E. im T.
Sycomore	leaf	April 8	G. F. R.
Horse Chestnut... ...	leaf buds opening ...	April 4	
„	just green	April 19	
Spindle	leaf	April 7	F.P.M. & J.C.P.
„	quite green	April 17	
Broom	v. young leaves ...	April 30	
Laburnum	young leaf	April 19	
Cherry Tree	leaf	April 8	Mrs. Blake.
Dwarf Cherry	young leaves ...	April 7	J.W.P. & G.F.R.
Dewberry	leaf	April 7	G.F.R. & J.W.P.
Hawthorn	hedges green ...	April 24	
Apple	leaf...	April 8	G.F.R. & E.imT.
Gooseberry	full leaf	April 7	H. R. A.
Dogwood...	young leaves ...	April 28	G.F.R. & J.W.P.
Wayfaring Tree	leaf	April 19	G. F. R.
Guelder Rose	leaf	April 19	W. D. P.
Privet	young leaf	April 19	J.W.P.
Ash	young leaf	April 28	J.W.P. & G.F.R
Bitter-sweet	young leaf	April 23	J.W.P. & G.F.R.
Deadly Nightshade ...	only 3 inches high	April 19	
Hop	2 feet high	April 13	E. im T.
Beech	leaf	April 25	J.C.P. & E. im T.
„	some green	April 30	
Oak	buds bursting ...	April 19	G. F. R.
„	young leaf	April 26	A.P.H. & J.E.H.
Black Bryony	4 inches high ...	April 26	A.C.H. & H.M.H.
Male Fern	4 inches high ...	April 22	A.C.H. & H.M.H.
Hart's Tongue	4 inches high ...	April 29	H. M. H.
Common Brakes ...	3 inches high ...	April 22	J. J. P.
Jasmine	leaf buds bursting ...	April 27	J. W. P.

In MAY Vegetation progressed, a very large number of plants being in flower at or about the same time as last year. There were, however, some very remarkable exceptions, which will be detailed below. About the 23rd a very intense frost set in, which did great damage, and from which some plants were a long time recovering.

List of Plants much before their times of flowering last year :—

Globe Flower (15 days) ; *Yellow Rocket* (6 days) ; *White Campion* (12 days) ; *Dusky Crane's Bill* (8 days) ; *Wood ditto* (16 days) ; *Meadow ditto* (14 days) ;

Spindle (10 days); *Dutch Clover* (8 days); *Ladies' Fingers* (6 days); *Laburnum* (7 days); *Dewberry* (14 days); *Hawthorn* (7 days); *Mountain Ash* (13 days); *Hogweed* (24 days); *Rough Chervil* (18 days); *Elder* (10 days); *Perfoliate Honeysuckle* (9 days); *Field Flea-wort* (8 days); *Holly* (13 days); *Hound's Tongue* (8 days); *Deadly Nightshade* (12 days); *Brooklime* (10 days); *Wild Thyme* (6 days); *Twayblade* (about 10 days); *Bird's-nest Orchis* (20 days); *Lily of the Valley* (12 days); *Solomon's Seal* (8 days); *Allium Molle* (9 days); *Quaking Grass* (15 days)

Those later than last year were—

Greater Celandine (6 days); *Fumitory* (30 days); *Charlock* (11 days); *Ragged Robin* (about 10 days); *Sycomore* (6 days); *Broom* (18 days); *Purple Clover* (8 days); *Bush Vetch* (8 days); *Small Burnet* (6 days); *Sibbaldia* (6 days); *Water Avens* (11 days); *Blue Sherardia* (11 days); *Crosswort* (13 days); *Gromwell* (16 days); *Field Scorpion-Grass* (20 days); *Ivy-leaved Toad-flax* (12 days); *Red Rattle* (7 days); *Common Sorrell* (25 days); *Walnut* (19 days); *Wood Sedge* (6 days); *Melic Grass* (13 days), and *Adder's Tongue* (11 days).

The following were in bud at the dates mentioned, but not in flower by the end of the month.

Meadow Rue		May 11	G. F. R.
Common Red Poppy ...		May 26	J.W.P. & G.F.R.
Bladder Campion ...	full bud	May 24	J. W. P.
Lime		May 10	J.W.P. & G.F.R.
Buckthorn		May 4	J.W.P. & G.F.R.
Scarlet Clover		by May 29	J. W. P.
Bird's-foot	full bud	May 16	J.C.P. & E.imT.
Meadow Sweet		May 13	J.W.P. & G.F.R.
Raspberry		May 10	J.W.P. & G.F.R.
Bramble		May 13	J.W.P. & G.F.R.
Dog Rose		May 19	G. F. R.
Syringa	full bud	May 25	
Water Dropwort ...		May 13	J.W.P. & G.F.R.
Wild Angelica		May 13	J.W.P. & G.F.R.
Guelder Rose		May 8	J.W.P. & L.H.Y.
Snowberry		May 27	E. im T.
Heath Bedstraw ...		May 27	J. C. P.
Valerian		May 8	A.C.H. & H.M.H.
Greater Knapweed ...		May 16	J.W.P. & L.H.Y.
Long-rooted Cat's-ear ...		May 16	J.W.P. & L.H.Y.
Rough Hawkbit.. ...		May 16	J.C.P. & E. im T.
Smooth Hawk's-beard ...		May 16	J.W.P. & L.H.Y.

Privet		May 11	J.C.P. & E.im T.
Bitter-sweet	full bud	May 20	J. W. P.
Knotted Figwort ...	v. young bud ...	May 23	J.W.P. & A.H.
* Lamb's Tongue ...		May 15	G. F. R.
Broad-leaved Dock ...		May 14	J.W.P. & G.F.R.
Curled Dock		May 3	A.C.H. & H.M.H.
* Small Nettle		May 7	G. F. R.
Great Nettle	full bud	May 23	J.C.P. & E. im T.
Black Bryony	full bud	May 19	W. D. P. & R. M. B. G.
Frog Orchis	full bud	May 23	J.C.P. & E. im M.
Notices of leafing, &c.			
Lime	green	May 4	
Buckthorn	young leaf	May 4	J.W.P & G.F.R.
Laurel	shoots 1 inch long ...	May 2	J.W.P & G.F.R.
White Beam Tree ...	full leaf	May 8	J.W.P. & L.H.Y.
Ash	full leaf	May 8	J.W.P. & L.H.Y.
Common Elm	shoots 3 inches long	May 5	G.F.R. & J.W.P.
Wych Elm	shoots 9 inches long	May 11	E. im T. & J. C.P.
„	seeds	May 14	G.F.R. & J.W.P.
Black Poplar	leaf	May 8	J.W.P. & L.H.Y.
Lombardy Poplar ...	leaf	May 4	G.F.R. & J.W.P.
Sweet Chestnut	leaf	May 20	J. W. P.
Oak	shoots 3 inches long	May 6	A.C.H. & H.M.H.
Hazel	leaf...	May 4	E. im T.
Walnut	leaf	May 20	J. W. P.
Male Fern	2 feet high	May 15	G. F. R.

Damage done by the Frost, May 23, 1867.

Shoots quite killed :—

Ash, Holly, Ivy, Walnut, Box, Potatoes, Asparagus, Virginian Creeper, Dahlia, German Iris, Beans, and all seedlings as Tropæolum, Convolvulus, &c.

Much damaged :—

Oak, Beech, Sweet Chestnut, Laurel, Portugal Laurel, Rose, Acacia, Hornbeam, Horse-chestnut, Laburnum, Sumach, Phillyrea, Pinsapo, Yew, Spruce, Rhododendron, Spiræa, Fuchsia, Dielytra, Geranium ; almost all fruit trees, as Apple, Pear, Plum, Damson, Gooseberry, Currant, also Strawberries where exposed, Peas, if in bloom, Young Cabbage, Celery, Vegetable Marrows, as well as several Wild Flowers, Nettle, Wood Sanicle, Deadly Nightshade, Enchanter's Nightshade, Bracken, &c.

* I think this was in flower before the end of the month. No note was taken of the date of flowering.

Had it not been for the frost of May, there would have been a remarkable correspondence between the times of flowering in 1867 and 1866, but as it was, those plants which *would* have been in flower towards the end of May were very much retarded; very few were much before their time of flowering last year, the only ones recorded were:—

Mallow (10 days); *Wood Vetch* (12 days); *Meadow Sweet* (more than 7 days); *Dog Rose* (8 days); *Snowberry* (20 days); *Yarrow* (7 days); * *Clustered Bell-flower* (17 days); *Chive Garlick* (6 days); *Great Reed Grass* (more than 16 days); *Hair Grass* (more than 8 days); and *Yellow Oat Grass* (6 days).

On the other hand, those plants which were retarded by the frost were the following:—

Corn Crowfoot (18 days); *Red Poppy* (17 days); *Hedge Mustard* (8 days); *Rock Rose* (12 days); *Bladder Campion* (6 days); *Thyme-leaved Sandwort* (about 20 days); *Bloody Crane's Bill* (11 days); *Round-leaved ditto* (25 days); *Slender Tare* (14 days); *Common Vetch* (12 days); *Bramble* (9 days); *Carrot* (21 days); *Dogwood* (26 days); *Honeysuckle* (9 days); *Field Scabious* (7 days): *Long-rooted Cat's Ear* (13 days); *Sowthistle* (9 days); *Mouse-ear Hawkweed* (17 days); *Foxglove* (12 days); *Cow-wheat* (12 days); *Sheep's Sorrel* (15 days); *Nettle* (26 days); *Blue Iris* (20 days); *Rough Meadow Grass* (27 days); *Wheat* (5 days).

In some few instances the earliest dates may not have been recorded, but as a rule the above may be considered in the main correct.

In bud at the dates mentioned, but not in flower by the end of the half-year.

Meadow Rue		June 21	E. im T.
Large Flowered St. John's Wort		June 16	E. im T.
Perforated ditto ...		June 19	J.W.P. & G.F.R.
Agrimony		June 10	J. W. P.
Hedge Parsley (T. Anthriscus)		June 14	G. F. R.
Hemlock		June 6	J.W.P. & G.F.R.
Quinancy-wort		June 18	G. F. R.
Lady's Bedstr aw ...		June 15	E. im T.
Valerian	full bud	June 8	
Greater Knapweed ...		June 10	J. W. P.
Privet		June 16	J. W. P.
Horehound		June 16	G. F. R.
Waybread		June 19	E. im T.
Sharp Dock		June 14	
Broad-leaved Dock ...		June 15	
Curled Dock		June 14	
Common Rush ...		June 14	

* This is, perhaps, not a fair comparison, the plant observed this year was a cultivated specimen. No wild plants were observed even in bud.

Notwithstanding the incessant watch kept up for procuring the earliest dates of flowering, some few have escaped notice, and some I have omitted to register. The following were certainly in bud or flower before we left Marlborough.

Cucubalus (v. young buds). Enchanter's Nightshade (in bud, if not killed by frost), Sickle-leaved Hare's-ear (nearly out); Laurustinus (a few flowers survived the frosts of January); Yellow Milfoil (in flower); Blue Sow-Thistle (nearly in flower); Orange Hawkweed (in flower); Rhododendron; Forget-me-not (in flower); Field Speedwell (*V. polita*); Clary (in flower); and Sun Spurge (in bud).

The following do not appear to have been observed even in bud:—*Prickly-headed Poppy; Smooth Long-headed Poppy; Corn Cockle; Rest-harrow; Hop Trefoil; Tufted Vetch; Trailing Dog-rose (R. arvensis); Hairy Willow-herb; Parsnep; Corn Chamomile; Ragwort; Burdock; Black Knapweed; Creeping Thistle (C. arvensis); Greater Periwinkle* (the plant seems to have died); *Field Bindweed (Convulvulus arvensis); Great Bindweed; Viper's Bugloss; Henbane; Water Betony; Eye-bright; Red Bartsia; Common Speedwell; Wood Betony; Scarlet Pimpernel; Good King Henry; Knot-grass;* and *Bur-reed.*

All of which have generally been observed in flower before the commencement of the holidays, and it seems very probable, therefore, that some were not even in bud by June 25.

ORNITHOLOGICAL NOTICES.

Kestrel (Falco tinnunculus)—Egg May 3rd, *J. E. Fenwick.*
Tawny Owl (Syrnium stridula)—Eggs in the Forest March 3rd.
Red-backed Shrike (Lanius Collurio)—Egg May 29th, *J. W. Parrington.*
Spotted Flycatcher (Muscicapa griseola)—young birds June 2nd, *J. W. Parrington.*
Missel Thrush (Turdus viscivorus)—Egg April 6th, *F. F. Back, G. Berry.*
Song Thrush (Turdus musicus)—Egg April 1st, *S. A. Rogers.*
Blackbird (Turdus merula)—Egg April 4th, *C. E. Crawley.*
Hedge Sparrow (Accentor modularis)—Egg April 7th, *F. F. Back, G. Berry.*
Redbreast (Erythaca rubecula)—Egg April 11th, *E. im Thurn.*
Redstart (Phœnicura ruticilla)—Seen April 1, *J. W. Parrington,* Egg, April 29. — *Braine, L. C. Calley.*
Whinchat (Saxicola rubetra)—Egg June 13th, *J. W. Parrington.*
Wheat-ear (Saxicola œnanthe)—seen March 27th, *A. Armstrong, Esq.*

Grasshopper Warbler (Salicaria locustella)—heard March 26th, *F. J. H. Jenkinson*, Egg May 28th.

Sedge Warbler (Salicaria plaragmitis)—Egg May 12th, *F. F. White; S. A. Rogers.*

Reed Warbler (Salicaria arundinacea)—Egg June 7th, *H. a'Court, J.G. Kitchen.*

Nightingale (Philomela luscinia)—heard May 1st, *A. C. Hilton.*

Common White-throat (Curruca cinerea)—Egg May 15th, *E. H. Davis, S. A. Rogers.*

Lesser White-throat (Curruca sylviella)—seen May 20th, *J.W. Parrington* and *G. F. Ruck.* Egg May 24th.

Willow Warbler (Sylvia trochilus)—seen April 15th, *F. J. H. Jenkinson*, Egg May 10th, *J. B. Oakeley.*

Chiff-chaff (Sylvia hippolais)—Egg May 18th, *A. Herklots.*

Gold-crested Wren (Regulus cristatus)—Egg April 28th, *R. Kingsford, J. G. Kitchen.*

Great Tit (Parus major)—Egg April 30th, *J. C. Palmer.*

Blue Tit (Parus cæruleus)—Egg April 26th, *L. C. Calley.*

Cole Tit (Parus ater)—Egg May 10th, *T. Tilleard.*

Long-tailed Tit (Parus caudatus)—Egg May 7th, *T. Tilleard, D. J. Blyth.*

Pied Wagtail (Motacilla Yarrellii)—Egg May 14th, *J. H. Lambert.*

Grey Wagtail (mortacilla boarula)—young birds June 16th, *J. W. Parrington.*

Tree Pipit (Anthus arboreus)—Egg April 25th, — *Knubley.*

Meadow Pipit (Anthus pratensis)—Egg May 25th, *J. B. Oakeley.*

Sky-lark (Alauda arvensis)—Egg April 16th, *J. W. Parrington.*

Wood-lark (Alauda arborea)—seen May 29th, *J. W. Parrington.*

Black-headed Bunting(Emberiza schœniclus)—Egg June 13th, *J.W. Parrington.*

Yellow-hammer (Emberiza citrinella)—Egg May 4th, *R. Glasse.*

Chaffinch (Fringilla cœlebs)—Egg April 25th, *E. B. Maitland.*

Mountain Finch (Fringilla montifringilla)—seen March 1st, *A. Herklots.*

House Sparrow (Passer domesticus)—Egg May 8th *P. M. Giles.*

Green-finch (Coccothraustes chloris)—Egg April 30th, *J. W. Parrington, A. Herklots.*

Gold-finch (Carduelis elegans)—Egg May 3rd, *H. C. Compton.*

Common Linnet (Linota cannabina)—Egg April 25th, *C. B. Sanders, S. Smallpiece.*

Starling (Sturnus vulgaris)—Egg April 24th, *J. W. Parrington, G. F. Ruck.*

Carrion Crow (Corvus corone)—Egg April 5th, *D. Soames.*

Rook (Corvus frugilegus)—Egg March 29th, *S. A. Rogers, A. Machen.*

Jackdaw (corvus monedula)—Egg April 20th, *J. T. Hunter, H. a'Court.*

Magpie (Pica caudata)—Egg April 13th, *J. W. Parrington, G. F. Ruck.*

Jay (Garrulus glandarius)—Egg April 20th, *J. T. Hunter.*

Common Creeper (Certhia familiaris)—Egg May 20th, *J. T. Hunter*, *A. G. Hunter.*

Common Wren (Troglodytes vulgaris)—Egg May 2nd, *J. W. Parrington*, *G. F. Ruck.*

Cuckoo (Cuculus canorus)—heard April 18th, *H. M. Moule, Esq.*, *C. M. Bull, Esq.*; Egg May 19th, *F. F. White.*

Kingfisher (Alcedo ispida)—seen March 24th, *H. Hillyard.* Egg May 24th.

Swallow (Hirundo rustica)—seen March 25th, — *Harenc.*

Sand Martin (Hirundo riparia)—seen April 13th, *G. H. Dawson.*

Swift (Cypselus apus)—seen April 13th, *D. Soames.*

Ring Dove (Columba palumbus)—Egg April 9th, *H. Van Heythuysen.*

Stock Dove (Columba œnas)—Egg April 16th, *T. Tilleard*, *J. T. Hunter.*

Turtle Dove (Columba turtur)—Egg May 17th, *E. im Thurn.*

Pheasant (Phasianus colchicus)—Egg May 16th, *J. W. Parrington.*

Stone Curlew (Œdicnemus crepitans)—seen April 23rd *J. W. Parrington*, *G. F. Ruck.*

Peewit (Vanellus cristatus)—Egg April 13th, — *Otter.*

Woodcock (Scolopax rusticola)—seen in the Forest, February 20th, *T. Tilleard.*

Common Snipe (Scolopax gallinago)—seen March 24th, *G. H. Dawson*, *W. D. Dowding.*

Land Rail (Crex pratensis)—heard April 18th, *C. M. Bull, Esq.*; Egg June 13th, *J. W. Parrington.*

Moorhen (Gallinula chloropus)—Egg April 9th, *L. C. Calley*, *P. Thursby.*

Common Coot (Fulica atra)—seen February 15th, *J. W. Parrington.*

Teal (Anas crecca)—seen February 9th, *T. Tilleard.*

Dabchick (Podiceps minor)—Egg April 23rd, *J. H. Lambert*, *E. Square.*

Herring Gull (Larus argentatus)—seen April 17th, *J. H. Lambert*, *E. Square*, April 22nd, *O. Ilbert, Esq.*

MUSEUM REPORT.

The following report on the condition and relative wants of the Museum has been drawn up by the President. In the Geological Section the society has had the benefit of a visit from Mr. J. R. Gregory, of the South Kensington Museum. This gentleman's aid was secured to give a skilled professional classification of the geological specimens, an excellent and well-considered measure, which has been of the greatest value. Mr. Stainton, whose name is so widely known to entomologists, and who is now happily by no means unknown at Marlborough, has kindly reported on the branch most familiar to himself. We hope that these, and the remaining details in the report will be looked at with care and interest, as they clearly show what the society's resources are, and how they may be improved.

We may now at once present Mr. Gregory's report:—

GEOLOGICAL COLLECTION.

The collection of fossils is well represented in the whole of the Tertiary series, except Glacial (Pleistocene) and a few Woolwich and Thanet characteristic species. The White Chalk poorly represented and Upper Greensand rich as regards number, but requiring a few characteristic species; Lower Chalk and Lower Greensand very fairly represented, but requiring a few of the common species; Gault very fair; Wealden and Purbeck and Portland particularly well represented; all the Oolites downwards, except inferior Oolite, very poorly represented indeed; Lias well represented by a very good series; Permian very thinly; Coal Measures a very good series; Carboniferous Limestone very moderately, ought to have about 20 species added at least; Devonian, very fair, except in fishes, requiring about 6 species; Upper and Lower Silurian particularly good, requiring only a few Llandeilo, Lingula, Tremadoc Slate, and Cambrian, about 10 or 12 species.

To Mr. Bright, Mr. Mullins, and Mr. Gilmore the society is mainly indebted for this collection.

MINERAL COLLECTION.

The mineral collection, formed mainly by the exertions of Mr. Gilmore, is thus noticed by Mr. Gregory, "requires about 60 specimens to make really a very good collection, the want of certain specimens of which make the collection imperfect, these being very important and well-known species; generally, however, the specimens are very good, and illustrative."

Since the above report was written, a large number of the specimens required have been added though the liberality of Mr. Bright, Mr. Sowerby, Mr. Delisle, Mr. R. W. Taylor, and Mr. Moule. Twenty-five specimens only are now wanted to complete the collection arranged in the glass cases; but the collection necessary for practical analysis is still very imperfect, both in the quality and quantity of its specimens.

ENTOMOLOGICAL COLLECTION.

This at present only consists of a collection of British Moths and Butterflies, upon which Mr. Stainton reports as follows:—"The collection is in good order and neatly arranged in a plain glazed cabinet of 32 drawers. The main object of the collection is to serve as a reference whereby to assist the boys in naming their captures, also to enlarge their ideas by enabling them to see representatives of species, which they have not themselves met with. There are many species, comparatively common, which are still wanting in this collection, but there are probably many entomologists scattered about the country, who, whether Old Marlburians or not, will gladly lend a helping hand to a collection formed for so useful a purpose."

For the present collection, the society is especially indebted to Mr. J. W. Dunning, Mr. Edwin Birchall, Mr. S. Stevens, Rev. Joseph Greene and Mr. T. Brown, of Cambridge, among those not connected with the College; and to W. W. Dayman, J. W. Mills, G. K. Mills, and A. Marshall, among old Marlburians. Individual specimens have been added from time to time by various members of the school, as opportunities occur; but it is a rule never to take from present members of the school unless they have their proper number in their own collection. Rarities, therefore, are seldom, if ever, added by them.

BOTANICAL COLLECTION.

The society may congratulate itself upon having a very excellent collection of Dried Plants. It was formed about seven years ago, and at that time required about 50 species to form a complete collection of British Plants. Recent discoveries have not been added, but it is hoped that the collection will not be long without them. Among the liberal donors of specimens may be mentioned Mrs. Beckett, of Lyncombe Vale, Bath, H. C. Watson, Esq., the late Mr. Borrer, the late Joseph Wood, Esq., the late Professor Henslow, Pro-professor Balington, Rev. W. Leighton, of Shrewsbury, Rev. A. Bloxam, Mr. W. Barton. A large collection also was obtained by purchase. The cabinet in which the specimens are kept was subscribed for by most of the Common Room. *

ORNITHOLOGICAL COLLECTION.

The collection of eggs contains representatives of the eggs of most of the birds found about Marlborough, many of them contributed by members of the school. The collection in other respects is very defective.

The collection of stuffed birds was only commenced in earnest this half year, and through the liberality of members of the Ornithological section, especially of E. im Thurn, already numbers 30 specimens, a list of which is given below.

Marsh Harrier (1), Kestrel (2), Sparrow Hawk (2), Ring Ouzel (1), Redbreast (1), Snow Bunting (1), Rook (1), Magpie (2), Nuthatch (1), Kingfisher (1), Night-jar (2), Pheasant (4), Red-legged Partridge (2), Peewit (1), Moorhen (1), Coot (1), Pintail Duck (1), Black-backed Gull (1), Ruff (1), Reeve (1), Stormy Petrel (1), Grey Phalarope (1).

* The President of the Society, Rev. T. A. Preston, who reports on this collection here, omits his own name. It is necessary, therefore, to state generally that he has been the Society's most constant benefactor, and that the Botanical department is specially indebted to his knowledge and his liberality.

THE WEATHER.

The weather at Marlborough during the first quarter of the year was so similar to what was experienced in other parts of England generally, that it will be sufficient to copy Mr. Glaisher's report.

"The month of January opened with a low temperature and severe frost; till the 5th day the deficiency of temperature was nearly 15° daily. On the 4th day this defect was as large as 23°, and the temperature was as low as Zero at many places, and below Zero at several. (It was 1° at Marlborough). Snow fell frequently all over the country, to an unusual amount, and rendered communication both by ordinary roads and by railroads difficult, and in some places traffic was wholly suspended. This unusually severe weather was succeeded by a sudden thaw, and a succession of heavy gales of wind from the west and south-west. The great change in the temperature broke up the frost, and cleared away the snow very rapidly, the sudden melting of which caused rivers to overflow in many parts of the country. From January 6th to the 10th days the average excess of daily temperature amounted to 7°.

"On the 11th day another frosty period set in, and extended to the 22nd day; during this period there were several very heavy falls of snow, particularly in the Northern parts of the kingdom, where several persons perished in the snow, being overtaken by it and frozen to death. The deficiency of temperature for these 12 days was on the average of 9¾° daily.

"On the morning of the 23rd day the weather underwent a rapid change; the mean temperature of this day was no less than 20° of higher temperature than that of the preceding day, thus introducing a period of almost unparalleled warm weather of the extraordinary duration of 35 days, or till February 26th. The average excess of temperature during this period was 7° daily; and we must go back as far as 1779, or 88 years, for an analagous period of the same length of higher temperature. In the years 1794 and 1850 the same temperature was nearly experienced. The melting of the snow at the beginning of this period, together with the heavy falls of rain, caused inundations in various places, and especially in some parts of Yorkshire and Lincolnshire.

"From February 27th to the end of the quarter, with the exception of the five days from March 23rd to 27th, the weather was always cold and of a wintry character; there were frequent falls of snow and sleet up to a very late period in the month all over the country. Till March 22nd, the deficiency of the temperature averaged 6½° daily.

"The months of January and March will be remembered for their severe frosts and heavy falls of snow; that of February for its high tempera-

ture, and the whole quarter for a very unusual succession of high winds and gales.

"The months of February and March were not favourable for agricultural operations; in the former month, owing to frequent rain and the flooded state of the land, and in the latter month, spring farm work was frequently interrupted by its protracted wintry character, damaging growing crops, and checking vegetation."

The only special remarks which need be made upon the above are (i) that at Marlborough, the amount of snow which fell in January was far less than elsewhere—in fact the water obtained from the melted snow was less than the amount of rain in January, 1866. (ii) In March traffic was greatly impeded by the snow which fell on 12 days at Marlborough; though more on the Downs. On the 23rd a sudden thaw took place, causing floods exceeding in extent any which had occurred during the last 53 years, but which lasted but a very short time.

The temperature during April was much about the average, but the air was very damp (more or less rain falling on 22 days), and the wind frequently very high; there was, too, very little sunshine, the amount of cloud being 8·4 whilst in the three previous years it was only 7·0, 4·7, and 6·5 respectively, (the *maximum* amount being represented by 10). At the same time there was but little frost, hence though vegetation did not progress rapidly, it did not experience any checks: in 1866 ground frosts were very frequent.

The temperature during May was very variable. It reached its maximum on the 6th, when it was 78·8°, but immediately afterwards fell till on the 13th it was only 48·3°, this cold period lasted till the 25th (except a slightly warmer period on the 18th, 19th, and 20th,) when it rose to about its proper average for the rest of the month. During the cold period from the 13th to the 28th snow fell at times and some very severe frosts occurred, which did great damage, destroying in a great measure the fruit crops, which up to that time were doing well, and showed promise of a plentiful supply of fruit. The mean temperature for the month, though higher than that in 1866, was below its proper average.

The temperature during June was much below its proper average. The month opened with warm weather, but from the 3rd to the 21st the temperature was below its proper average, a break, however, occurring on the 10th, 11th, and 12th, when it was above 70°. From the 23rd to the end of the month the temperature increased by day, but generally kept on decreasing at night, so that the range of temperature was very remarkable, being more than 35° on the 28th, and 32° on the 30th.

	Mean height of Barometer.		Monthly range.		Mean temperature of air.		Mean daily range.		Maximum in shade.		Minimum in shade.		Maximum in sun.		Minimum on Grass.		Mean degree of Humidity		Mean amount of Cloud.		Amount of Rain.		No. of days on which it fell.	
	1867	1866	1867	1866	1867	1866	1867	1866	1867	1866	1867	1866	1867	1866	1867	1866	1867	1866	1867	1866	1867	1866	1867	1866
	in	in	in	in	°	°	°	°	°	°	°	°	°	°	°	°					in	in		
JANUARY...	29·204	29·375	1·480	1·778	33·2	41·5	13·0	12·7	54.5	58·8	1.0	16·1	82·4	85·1	3·2	13·8	91.0	89·2	7·1	7·8	4·102	4·400	18	23
FEBRUARY	29·602	29·227	1·665	1·770	44·0	39.7	11·9	13·2	64.6	58·6	29·6	37·2	100·8	88.9	19.2	15·5	89.6	90·4	8·5	7.2	2·531	3·857	21	22
MARCH ...	29·310	29·221	1·512	1·340	35·5	39·5	11·2	14·9	54·4	61.6	19·3	15·3	114·6	115·9	19·0	12·6	92.2	86·4	8·0	7·9	3·824	2·327	21	20
APRIL.....	29·340	29·430	1·289	0·986	47.5	46.3	15·5	15·8	65·7	72.8	29·2	30·0	130·0	122·0	22·8	20.5	89.5	83·7	8·4	7·0	2·831	2·393	22	21
MAY	29·422	29·512	0·780	0·872	51·3	48·8	18·3	21·0	78·8	70·9	25·5	25·7	138·3	122.5	22·4	18.3	81.8	67·4	7·5	5·8	2·447	1·919	12	10
JUNE	29·642	29·469	0·906	0·814	55·7	58·8	18·9	19·4	77·8	81.0	36·4	39·7	142·2	121·0	31·5	42·2	83.1	78·0	7·0	6·6	1·696	3·238	12	18
MEAN.....	29·420	29·372	1·272	1.260	44·5	45·8	14·8	16·2	...	...	...	...	...	...	...	...	87·9	82·5	7.7	7·0	...	...	...	...

Total amount of rain during the six months in 1867—17·431 inches; in 1866, 18·134 inches.

ACCOUNTS.

Received.	£	s.	d.
Balance from December, 1866	20	6	9
Subscriptions from Members	4	17	0
Donations...	11	6	6
Sale of Reports, Midsummer, 1866	0	16	6
,, Christmas, 1866	22	18	6
	£60	5	3

Paid.	£	s.	d.
Printing of Third Report	15	0	0
Ditto Fourth Report	25	0	0
Cabinet Maker	2	2	0
Bookcase, &c.	9	7	0
"The Zoologist" (1st instalment)	2	16	0
Stationery	1	0	3
Bookbinding	0	13	6
In hand	4	6	6
	£60	5	3

June, 1867.

T. R. DUMERGUE, Hon. Treasurer.

LIST OF DONATIONS.

	£	s.	d.
A. Armstrong, Esq.	0	2	6
Rev. H. Bell	0	10	0
E. H. Carr	0	2	6
G. H. Dawson	0	5	0
W. W. Dayman, Esq.	0	10	0
Rev. W. Gardner	0	5	0
A. Herklots	0	2	6
C. Hodgson, Esq....	1	0	0
R. Hunter, Esq.	1	0	0
W. Koch, Esq.	0	10	0
E. im Thurn	0	7	0
F. J. H. Jenkinson	0	6	0
J. Mills, Esq.	0	10	0
H. M. Moule, Esq.	1	0	0
Mrs. Norris	1	1	0
J. C. Palmer	0	4	6
J. W. Parrington...	0	2	6
Rev. T. A. Preston	0	10	0
Rev. J. J. Pulleine	0	7	6
H. T. Stainton, Esq.	2	0	0
Rev. T. Stanton	0	10	0
Smaller	0	0	6
	£11	6	6

SPECIAL DONATIONS

For purchasing Specimens—For the Collection of Minerals.

Rev. J. F. Bright	1	0	0
Rev. J. Sowerby	1	0	0
Rev. G. W. Delisle	0	10	0
R. W. Taylor, Esq.	0	10	0
H. M. Moule, Esq.	0	10	0

LIST OF LIBRARY.

No. of Vols.	Name of Book.	Donor.
5.	Intellectual Observer	Rev. J. M. Fuller.
5.	Popular Science Review...	,,
3.	Recreative Science	,,
1.	Flora of Marlborough	Rev. T. A. Preston.
2.	The Entomologist	,,
2.	Entomologist's Monthly Magazine	,,
2.	The Ibis	,,
6	The Geologist	Rev. T. Cornthwaite.
3.	The Geological Magazine	,,
1.	Ootheca Woolleiana (Part 1)	Professor Newton.
1.	Memoir of J. Woolley	,,
1.	Cassell's Birds	A. Herklots.
1.	Synopsis Floræ Helveticæ	Rev. H. Baber.
3.	Flora Germanica...	,,
1.	British Algæ	Mrs. Gray.
1.	British Ferns	,,
7.	Linnæus Systema Naturæ	Rev. H. E. Booth.
1.	British Spiders	H. A. Evans, Esq.
1.	Kirby and Spence's Entomology	W. W. Fowler, Esq.
1.	Dana's Mineralogy	J. B. Gilmore, Esq.
2.	Various Papers reprinted from the Quarterly Journal of the Geological Society ...	H. Woodward, Esq., F.G.S., &c.
1.	Montagu's British Birds...	Rev. T. A. Preston.
1.	Morris' British Fossils	,,
1.	Wood's Index Entomologicus	Purchased.
1.	Handbook of Geological Terms (Page) ...	,,
2.	Hewitson's British Birds' Eggs	,,
23.	Zoologist...	,,
1.	Sowerby's British Wild Flowers	,,

MARLBOROUGH:

C. PERKINS, PRINTER, HIGH-STREET.

REPORT

OF THE

MARLBOROUGH COLLEGE

Natural History Society,

FOR THE

HALF-YEAR,

ENDING CHRISTMAS, 1867.

"Tum mihi Naturæ libeat perdiscere mores,
Quis Deus hanc mundi temperet arte domum."

MARLBOROUGH:
Printed by C. Perkins, Times Office.
1868.

28.12.80

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PREFACE.

To begin by refering to an appeal made to the upper part of the School in our last Report, we have still to regret that the actual ranks of the Society are so thinly recruited from the Sixth and Fifth Forms. Several reasons may be suggested for this state of things: but, however it may be accounted for, it is a point to be regretted, partly on School grounds, partly also as indicating a low degree of interest in subject matter which is yearly becoming more prominent in schemes of liberal education.

On the other hand, there has been a very striking increase indeed in the general attendance at the Meetings. There have been as many as 113 present at a single meeting. And, comparing the two last years, the average number of persons present in 1867 was 81.3 against 41.3 in 1866; and the average of visitors was 57.4 in 1867 against 24 in 1866. These facts speak for themselves. The printed notices of meetings which have recently been very carefully distributed by the Secretary have probably done much to promote attendance.

The presentations made to the Society during the last half-year were numerous and valuable. There have been presented by J. B. Gilmore, Esq., a collection of Birds' Skins from the Orkneys; a large collection of Fossil Fish, and some remains of a Pictish Chief's dwelling; by J. M. Donne, a collection of Zoological specimens from the West Indies; by Mr. G. Gauntlett, eggs of Gold and Silver Pheasant; by the President, eggs of Raven, Heron and Greater Bittern, Blue-throated Warbler; by Mr. T. Brown, a pair of Acidalia Interjectaria: by E. C. Sewell, two pair Buffalo Horns, Head of Albatross; by Mr. H. M. Moule, "Conversations in Chemistry," 2 vols.; Wells on *Dew*; by E. im Thurn, pairs of Song Thrush (with nest of young

birds), Missel Thrush, Redwing and Fieldfare; by Rev. J. Greene, a box of Insects; by W. Bartlett, Esq., some Fossil Sponges from the Gault; by Mr. W. Odham, a monstrosity of the Red Deer's Horn, and a Pipe Fish; a practical scientific volume by Mr. F. C. Lightfoot; thirty-three Birds' Skins by Rev. J. F. Bright; seven Birds' Skins from J. W. Parrington; and several small contributions from Mr. S. Dixon (Lecturer in Geology), Mr. Brampton, Mr. Velvin, and A. R. Wiggin. The Society's best thanks are especially due to J. B. Gilmore, Esq., for the splendid donation which stands first on the list.

The Society is rich in periodicals connected with scientific research. It takes in on its own account the *Geological Magazine* and *Zoologist*; from the President it receives the *Ibis*, the *Entomologist*, and the *Entomologist's Monthly Magazine*; and the Rev. J. M. Fuller most kindly continues the *Intellectual Observer* and *Popular Science Review*.

We cannot but think that it would be an unfortunate sign for the future should these and other stores of information accumulate without some active use being made of them.

In conclusion, we remind the School of the Natural History Prizes, kindly offered by the President for an Essay on some branch of Natural History. The prospectus of these prizes is enclosed; the essays should be sent in by June 1st, 1868. It may be hoped that they will help to stimulate the practical study of those pursuits which the proposer has already done so much to encourage in the School.

LIST OF MEMBERS.

PRESIDENT.

* Rev. T. A. Preston.

SECRETARY.

* G. H. Dawson.

TREASURER.

Rev. T. A. Preston.

LIBRARIAN.

E. im Thurn.

COMMITTEE.

The Ex-officio Members.
C. M. Bull, Esq.
G. Holden.
E. im Thurn.

EDITING COMMITTEE.

Rev. T. A. Preston.
G. H. Dawson.
G. H. Holden.

HONORARY MEMBERS.

The Rev. the Master.
A. Armstong, Esq.
H. M. Moule, Esq.
W. E. Mullins, Esq.
F. E. Thompson, Esq
C. M. Bull, Esq.
Rev. J. F. Bright.
Rev. J. Sowerby.
Rev. H. Bell.
Rev. C. W. Tayler.
A. Babington, Esq.

MEMBERS.

T. E. Maclean.
A. Herklots.
E. H. Carr.
A. P. Hockin.
* F. J. H. Jenkinson.
A. C. Hilton.
J. E. Hilliard.
H. M. Hilton.
E. Almack.
J. C. Palmer.
J. B. Oakeley.
E. Maitland.
H. A'Court.
P. G. Young.
G. F. Ruck.
R. B. Jarvis.
W. G. De Jersey.
F. J. C. Boles.
J. B. Fuller.
M. H. Smith.
G. E. Manisty.
W. Greg.
M. H. Soames.
H. Manders.
* G. G. Monck.

* Heads of Sections.

RULES.

1.—That this Society be called the Marlborough College Natural History Society.

Constitution.

2.—That the Society consist of Members and Honorary Members.

Officers.

3.—That the Officers of the Society consist of a President, Secretary, Treasurer, and Librarian, to be elected from and by Members of the Society.

Management.

4.—That the affairs of the Society be conducted by a Committee, consisting of the President, Secretary, and three other members of the Society, to be elected from and by Members of the Society: three of whom shall form a Quorum.

President.

5.—That in case of an equality of votes, the President shall have a double or casting vote.

6.—That in the absence of the President, the Committee be empowered to request any member of the Society to take the chair.

Committee.

7.—That on the occurrence of any election, each member of the Committee have double the number of votes of any other Member of the Society.

8.—That two Members be appointed half-yearly by the Society, to assist the Secretary in Editing the Report.

Secretary.

9.—That the duties of the Secretary be to keep a list of all the Members of the Society, and of all former Members and Benefactors who may wish to receive the Reports of the Society; to summon meetings (when necessary) of the Society; to keep a detailed report of the proceedings, as well as lists of Members and Visitors present at each meeting, and generally to act under the direction of the Committee in all matters connected with the welfare of the Society.

10.—That in the absence of the Secretary from any meeting of the Society, minutes of the proceedings be taken by a member of the Committee, appointed by the President.

Treasurer.

11.—That the duties of the Treasurer be to collect all sums of money due to the Society; to receive all donations of Money; and to disburse all sums payable by the Society out of the funds entrusted to him.

12.—That the Treasurer furnish half-yearly a detailed account of the receipts and disbursements to be audited by the Committee.

13.—That the funds of the Society be placed in the College Bank, and that no money be withdrawn by the Treasurer without the signature of the President to the order; or in his absence, that of the Secretary.

Librarian.

14.—That the duties of the Librarian be to keep a catalogue of the Library, with the names of the Donors; to see that the Library Regulations are carried into effect; to be responsible for the order of the Museum, and when necessary to assist the Secretary in the distribution of the Reports of the Society.

Library.

15.—That Any Member of the Society be at liberty to consult any of the books belonging to the Society, but that only certain volumes, to be decided on by the Committee, be allowed to be taken from the room.

16.—That if any Member wishes to take a volume from the Museum, he shall give his name, and the name of the book, to the Librarian, who shall enter them in the book kept for the purpose.

17.—That every volume so taken out be returned by the end of the quarter, but that no book be kept more than one month.

18.—That if any volume be damaged, such damage shall be reported by the Librarian to the Committee, who shall decide upon any further proceeding in the matter

Museum.

19.—That any Member of a section, who is not a Member of the Society, be allowed access to the Museum at such times as it is open to Members of the Society generally, provided he first obtain leave from the President, which leave shall be renewed every quarter, but may be taken away at any time, if the privileges be abused in any manner.

20.—That the same privileges be extended, under the same conditions, to such other Members of the School who may wish to use the Library and Collections for the purposes of study, provided there be a reasonable excuse for their not belonging to a section.

21.—That in all cases the Museum be used for the study of Natural History alone, and not as an ordinary Reading Room.

Members.

22.—That the election of new Members rest entirely with the Committee.

23.—That every Member pay a half-yearly subscription of 2*s.* 6*d.*, to be paid at the first meeting of the Society in that half-year.

24.—That if a Member be elected at, or after the Quarter, he shall only pay 1*s.* on Election.

25.—That Members have the right to be present, to state their opinions and to vote at all general meetings of the Society; to introduce a visitor at general meetings of the Society; to have personal access to, and to introduce a visitor to the Museum; and to have a copy of the Report half-yearly.

Visitors.

26.—That on such occasions when the number of those who wish to be present as visitors at the general meetings of the Society is greater than the number of members who attend, the President and Committee shall be empowered to admit two or more each, as shall seem fit.

Honorary Members.

27.—That Honorary Members have all the privileges of Members, except the power of introducing a member of the School to the meetings of the Society.

Suspension of Members.

28.—That any Member be liable to be excluded from the Society by the Committee, if, in their opinion, he shall have failed to show sufficient energy the working of the Society.

Sections.

29.—That sections be formed for the more accurate study of the different branches of Natural History, and that the Heads of these sections be chosen by the Committee half-yearly from Members of the Society.

30.—That these sections shall hold meetings as often as shall seem fit to the Heads of the several sections, at which any member of the School, with the sanction of the head of that section may attend.

Meetings.

31.—That ordinary meetings of the Society be held once a fortnight, but that the Secretary be empowered to call extraordinary meetings when necessary.

New Rules

32.—That any Member of the Society have power to propose any new rule or any alteration in an old one, provided the motion be seconded by another Member.

MEETING HELD AUGUST 23RD, 1867.

THE following donations were exhibited, and thanks ordered to be given to the Donors :—

A collection of 43 Birds' Skins, among which were those of the Raven, Great Northern Diver, Greater and Lesser Black-backed Gulls, Common Gull, Cormorant, Velvet Scoter, Puffin, Razor-bill, Black Guillemot, and Common Guillemot, Redshanks, Oyster-catcher, &c., by J. B. Gilmore, Esq.

A large collection of Fossil Fish, from the Orkneys, also by J. B. Gilmore, Esq.

A Bull Frog, pair of Sawyer Beetles, Young Shark, Flying Fish, Lizards, and other West Indian Curiosities, by J. M. Donne.

Eggs of the Gold and Silver Pheasant, by Mr. G. Gauntlett.

Egg of the Raven, by the President.

A pair of *Acidalia Interjectaria*, a species of moth new to Britain, by Mr. T. Brown, of Cambridge.

A pair of Buffalo Horns, and a Head of an Albatross, by E. C. Sewell.

A work entitled "Conversations in Chemistry," by H. M. Moule, Esq.

E. IM THURN exhibited a specimen of the Bohemian Waxwing, shot in Devonshire.

J. B. JARVIS, a small Hornet's Nest with the Queen Hornet.

G. H. Dawson was elected to the office of Secretary, to take the place of W. R. Carles, who resigned, and E. im Thurn to the Committee and Office of Librarian, vice R. F. Isaacson.

A Subscription was afterwards opened towards defraying the cost of a a Wall-Case, for the reception of the Collection of Birds belonging to the Society; and the Sum of £2 19s. was collected on the spot.

There were 46 persons present.

MEETING HELD SEPTEMBER 6TH, 1867.

Ornithology.

THE following additions were made to the Museum :—A case containing a Heron and a Greater Bittern (a British specimen), presented by the President; a case containing pairs of Song Thrush (with nest of young birds), Missel Thrush, Redwing and Fieldfare, presented by E. im Thurn.

E IM THURN exhibited a Blue-throated Warbler (British specimen) and White variety of the Willow Wren; and the President a pair of Eggs of the Bee Eater from Spain.

Entomology.

Donation:—A box of British Insects, among which were specimens of *N. Cucullina*, *N. Ditrapezium*, 5 species of *Eupithecia*, &c., by the Rev. J. Greene. F. J. H. Jenkinson gave his Report.

Larva of *A. Alni*, found by L. Chapman, and variety of larva of Poplar Hawk (*S. Populi*), found by J. B. Oakeley, were exhibited.

Botany.

THE PRESIDENT gave his report, recording the discovery of two plants new to the College list, and exhibited specimens of the *Prickly Pear* and *Aloe* from Spain.

There were also exhibited Hairs from an Elephant's Tail, by C. J. O. Irwin, and an Impression of the Seal of a Priest of Thibet, by T. E. Maclean.

A Lecture was given by C. M. Bull, Esq., on his Walking Tour in Cornwall.

R. B. Mainwaring, A. Herklots, A. M. Hardy, and F. W. Head tendered their resignations, and G. E. Manisty was elected a member of the Society.

Notice was given that a private meeting of the Society would be held on Tuesday, September 10th.

There were 95 persons present, among whom were the Master and Mrs. Bradley, Mrs. Bull, and an unusually large number of Members of the Common Room.

MEETING HELD SEPTEMBER 10TH, 1867.

THIS was an extraordinary meeting, called at the request of A. C. Hilton and E. H. Carr, to consider the expediency of abolishing Rule 22, and substituting in its place the following:—

"That Candidates for admission into the Society be proposed by any one Member, and seconded by another at any ordinary meeting of the Society, and be balloted for at the next meeting, and that not less than two-thirds of the Members balloting shall elect."

After considerable discussion, in which A. C. Hilton and H. M. Hilton spoke in favour of the amendment, and the President, C. M. Bull, Esq., and G. H. Dawson against it, the question was put to the vote, and lost by a majority of 8; 13 against 5 for.

There were 19 members present.

MEETING HELD SEPTEMBER 20TH, 1867.

THE following donations were announced, and thanks ordered to be given to the donors:—

A set of Fossil Sponges, from the Upper Gault, at Savernake, collected and presented by Mr. W. Bartlett.

A pair of Buffalo Horns, by E. C. Sewell.

A curious monstrosity of a Red Deer's Horn, and a Pipe Fish, by Mr. W. Odham.

A work entitled "That's It," by F. C. Lightfoot, Esq.

Entomology.

F. J. H. JENKINSON gave his report, recording the capture of 3 species new to the College list.

J. B. FULLER exhibited a specimen of the moth *O Literana*, the first specimen taken in the neighbourhood.

THE PRESIDENT exhibited two Boxes of Brazilian Insects.

Ornithology.

G. H. DAWSON exhibited a pair of Hawfinches, shot at Preshute, and purchased by the Society: and E. im Thurn a remarkably fine specimen of the same, and a Corncrake, which latter he presented to the Society's Collection.

Archæology.

T. R. DUMERGUE announced the commencement of a collection of Coins for the Museum, and exhibited, on behalf of W. H. Churchill, a silver token of the county of Devon.

E. C. SEWELL exhibited a Japanese box and coins.

Mineralogy.

E. B. MAITLAND exhibited a fine specimen of Iceland Spar, Galena, and Sulphate of Iron; and W. Greg, specimens of Blende, from Alston, Cumberland; Iron Pyrites, and Liver Iron Ore, from Workington.

Botany.

THE PRESIDENT gave his Report, recording the discovery of the Blue Fleabane, *(Erigeron acris)*, new to the College list, by G. F. Ruck, and exhibited specimens of the Stinkhorn Fungus (*Phallus Impudicus*); and, on behalf of A. J. Norris, a drawing of *Cordiceps militaris*, a fungus peculiar to under-ground pupæ of moths.

E. IM THURN exhibited a Photograph of the black-stalked variety of the Lady Fern.

E. IM THURN read a paper, illustrated by numerous specimens, on Wasps and Wasps' Nests.

A. Babington, Esq., was elected an Honorary Member, and J. B. Fuller, M. H. Smith, and G. H. Holden, Ordinary Members.

There were 72 persons present: 19 members, 53 visitors.

MEETING HELD OCTOBER 4th, 1867.

Ornithology.

G. H. Dawson exhibited a collection of 33 Birds' Skins, presented to the Society by the Rev. J. F. Bright; and E. im Thurn, a light-coloured variety of the Barn Owl.

Entomology.

H. M. Hilton read a list of notices.

Geology, &c.

The President exhibited a specimen of Nickel, from Inverness, and of Meteoric Iron, from Tolucca, in Mexico.

E. Almack exhibited a specimen of Iron Pyrites, in flint; H. M. Hilton, a fossil fish, from the Orkneys; and W. Greg, specimens of stalactite (polished and unpolished).

Botany.

The President, on behalf of Dr. Fergus, exhibited a living specimen of the Castor Oil Plant, in flower, and seeds of the same; also, Maize, Reed and Palm, from Spain.

Archæology.

T. R. Dumergue exhibited some coins of the Roman Empire, presented to the Society by J. C. Brown.

There were also exhibited a living specimen of the Cray Fish, from the Kennet, by the President; some "Trophies from Waterloo," by H. M. Hilton; and a Spanish Knife, by F. B. Jarvis.

T. R. Dumergue read the following paper, illustrated by diagrams, on

THE WANS-DYKE.

The peculiar interest which is presented to us by a study of the Archæology of Wiltshire, is caused, not so much by the number, as by the variety of its antiquities. Besides ancient curiosities and associations belonging to the last eight centuries, we find relics of the Britons, the Romans, and the Saxons, in as rich a variety as can be boasted of by any county in England.

Of the British period, we find the remains of villages, of trackways leading from one village to another, of strong fastnesses, of extensive earthworks of various kinds, and a large number of reminiscences of the early British

religion, cromlechs, cistvaens, barrows, stone circles, and, lastly, the two supposed temples of Abury and Stonehenge. All these are to be found in this county.

Roman work of various kinds is traceable in this county in the roads, towns, military stations and camps, pavements, coins, and the like.

The Saxons also have left several traces in our neighbourhood, chiefly in their earthworks. It is to be observed, however, that most of these earthworks appear to have been formed at two distinct periods, which seem to show that the Saxons built upon and strengthened the works of their predecessors, in preference to making fresh works.

Having made this brief summary of the kind of antiquities which recall to us the habits and life of these three races, I am now in a position for commencing my subject.

The Wans-dyke, as most of you know, is a great earthwork extending through the entire breadth of this county, and also through Somersetshire, running from east to west. It is more than 80 miles long, and seems to have formed a connecting link between the Severn and the Thames. It consists of a rampart and a moat, running side by side, the former being on the south side of the latter. From the top of the rampart to the bottom of the moat, it measures, in some parts, 40 feet. Its course appears to have been chosen in such a way as that it should form a connecting link, not only between the Thames and the Severn, but, also, between several fortresses situated between those two rivers. Such is the Wans-dyke itself; I shall next speak of the persons by whom it was probably constructed, for constructed by human hands it certainly was.

First of all, we are safe when we say that it could not have been erected by any Normans or Englishmen, in the modern sense of the word. It must have been made before the Norman Conquest, as we certainly should have some record of its construction had it been made after it. Nor can it well have been made by the Romans, for such a structure is quite out of keeping with anything else of which the Romans have left us an example. They have left us specimens of their towns, baths, villas, roads, bridges, and camps; but nowhere do we find them to have constructed a huge barrier like the Wans-dyke (for such was evidently its object) to prevent an enemy from making incursions from the north; though it is difficult to conceive the possibility of its ever being sufficiently manned. Who, then, besides the Romans, and before the Normans, lived in the country south of the Wans-dyke? I say south of the Wans-dyke, because the moat is north of the rampart, which, granted that the earthwork was made for a defence, proves that those whom it was intended to protect must have lived south of it. The two races whom we know to have occupied this part of the country, and to whom the Wans-dyke has been at

various times ascribed, were the Belgæ, before the Roman Conquest, and the Saxons after it.

That the former constructed it was the opinion of Stukely. These Belgæ lived in Somerset, Wilts, and Hants, making Winchester (*Venta Belgarum*) and Bath their principal towns. Stukely supposed them to have been one branch of the great Belgic family, who had streamed into Gaul at an early period, and from whom modern Belgium receives it name; they are, however, by some persons considered as being a totally different race from those of Gaul. The name Wans-dyke he derives from *guahan, dyke, i.e.*, 'division dyke,' the object of it being to shut out the Celts or, it may be, the Romans, who might attack them from the north. Between this dyke and the South Coast there are three others of a somewhat similar kind, and these four may be naturally supposed to have been raised at different periods by the Belgæ, the second being thrown up as the first was crossed by the enemy, and so on. Stukely believes, too, that Divitiacus, a king of the Suessiones, of whom Cæsar speaks, was the actual constructor of the dyke, he having been thought by some persons to have founded Devizes, which is in the same neighbourhood. But, apart from this theory, another has been very widely held, namely, that the Saxons made it, either as a barrier between Wessex on the south, and Mercia on the north, or else between the Saxons of Wessex, and the Danish invaders. And certainly the name appears to be Saxon, Wans-dyke being very probably a corruption of *Woden's ditch*, Woden being the War-god of the Saxons and Danes; Aubrey tells us that the Saxon name was Wodenesdic. The name of this god appears also in Wodenburghe (identical now with Woodborough, near which the Wans-dyke passes, or else with Wanborough, a village near Swindon) where Ceauline, a King of the West Saxons, sustained a severe defeat from the Britons, which caused him to fly from the country.

This latter theory is supported by the existence of a similar structure, the well-known Offa's-dyke, built by Offa, King of Mercia, between the mouths of the Dee and the Wye, to protect his kingdom from the Britons who inhabited Wales.

I shall now briefly trace the course of this dyke from its western extremity. It is supposed to have started from Portishead, a small town at the mouth of the Bristol Avon, and formerly a Roman harbour. But it does not stand out prominently until it reaches a place called Maes Knoll Camp, about five miles south-west of Bristol. It then crosses the high road, and makes for Stantonbury Camp. Both of these Camps appear to be British, though they bear marks of Saxon improvement. From the latter, which is of great size, one can get a very fine view of Bath on one side, and of the Welsh Mountains on the other. In the neighbourhood of Bath the Wans-dyke is totally lost sight of, and, excepting a small fragment here and there, we do

not recognize it again until we reach Morgan's Hill, a down lying between Bishop's Cannings and Calne. Here it suddenly branches out from the Roman Road called Julian Street, with which our Bath Road coincides as far as Silbury Hill. It appears that the Roman Road had been made in the ditch of the Wans-dyke itself. At first sight, we should certainly conclude this, but, when we compare the straight course which the Roman Road still takes after its junction with the Wans-dyke, with the continual winding and turning which, in every other part, characterizes the course of the dyke, we begin to doubt whether the two could have really run on for any distance together. But, before throwing overboard its claims to British origin, and the theory that the Romans seized upon it as being convenient for converting into a road, we ought to find out what its course really is, if it be not identical with that of the Roman Road; but, this having been found impracticable, we need not relinquish the idea of the two being, for some distance, coincident,—in other words, the idea that the Wans-dyke existed prior to the Roman Road, and, therefore, was a Belgic structure.

On tracing the course of the dyke further eastwards, we soon descend the down and cross the modern Devizes Road, at a place called Shepherd's Shore, where a single cottage, formerly an inn, stands alone in the valley, and where little is to be seen upon the downs for miles around except, here and there, a British tumulus and this huge ditch and mound.

The dyke, then, after descending the hill and being pierced through by the modern high road, immediately ascends another hill, called Tan Hill (the name being a corruption of St. Anne's Hill), upon which, in former times, a fair used to be held annually. Over this hill, which is of great height, the Wans-dyke pursues its course, continually winding about, up-hill, down-hill, to the right, to the left, according to the requirement of the hill. Here it may be seen to great perfection; the rampart is in this part exceedingly high, the ditch very deep. And I would advise any one who, on the whole holiday, or when any other opportunity occurs, may want a good walk in which to have an extensive view, a good fresh breeze, and something to see at the end of his journey, to walk along the Wans-dyke, upon St. Anne's Hill, having turned off from the Bath Road at Beckhampton, and to continue this route as far as Shepherd's Shore, then to strike for Bishop's Cannings, and, finally, to Devizes.

Before I pass on from Tan Hill, let me mention a circumstance which has thrown great light upon the difficult question of the origin of our Dyke. At the western portion of this hill, it was discovered some years ago, on making a cutting through the rampart, that it consists of two totally different layers. These layers were probably made at very different times, hence we may infer that the bank was, at a subsequent period, heightened, and thus made a

stronger barrier than it had been before; and this seems to harmonise with what I have already said, namely, that the Belgæ probably constructed it at first to protect themselves from the incursions of the Celts or Romans; but in after times the Saxons strengthened it considerably, gave it its name, and used it as a barrier to divide two great kingdoms.

It continues its winding course over Tan Hill, the rampart never meeting with a break except where a sheep-road has been cut through it. After extending for several miles over the down, it enters the West Woods a short distance beyond Lockeridge, through the entire length of which it passes, no longer uncovered and bare, as it was on Tan Hill, but thickly overgrown with wood. It next passes through the southern part of Manton Coppice, and meets the Pewsey Road 200 yards beyond the sign-post pointing to Manton. At the point where it meets the high road, its moat has been made into a bridle road, just as the Roman Road runs along the moat on Morgan's Hill. As it leaves the road on the south side, it passes across a field, where nearly all traces of it have been removed by the plough; but when it reaches the opposite side of the field, it runs along the edge of it, crosses the railway, and passes the two larch clumps, on the way to Martinsell, with which you are all familiar. But in this part the moat seems to have been much filled up, and the rampart to have sunk a great deal. After continuing about a mile further towards the Forest, it suddenly disappears altogether for a time, having been destroyed by the plough. All traces of it have gone until it has passed right through the Forest, and we again track it for a short distance on the left of the high road from Marlborough to Great Bedwyn, where it takes a southerly course, and after once more disappearing re-appears at Chisbury Castle. This fortress, situated as it is only six miles from here, and, therefore, easily accessible to most of us, I shall attempt to describe. It is of an oval form, surrounded partly by a double, partly by a treble rampart, except for a short distance on its eastern side, where the "vallum" has been levelled in order to make way for buildings. In area it measures nearly 15 acres (a larger area than that of Barbury, which is only 12½ acres), while the circuit of the outer-rampart is 1012 feet. From the top of the vallum to the bottom of the moat is a descent of 45 feet.

It is very well situated upon a rising ground between the two Bedwyns, and, from the number of trees growing upon its banks, forms a conspicuous object from the railway. We know nothing of the earlier history of the Castle; an examination of the rampart has brought to light, 15 feet below the present surface, a turfed embankment, some old British pottery, black ashes, and charred wood, which prove that it was originally a British stronghold. But the present rampart has been thrown up over these British remains, showing that, at some subsequent period, its fortifications were

strengthened. And this bears out the tradition existing, namely, that Cissa, a Prince of the West Saxons, Viceroy of Wilts and Berks, under Escuin, made this his stronghold. Here, as the Saxon Chronicle informs us, a bloody conflict took place in 695, between Wulphere, King of Mercia, and Escuin, King of Wessex. It seems probable that the Britons had constructed it as a place of safety for their families and property in time of war, the charred wood being the remains of their huts; and as Barbury, a British work and the scene of the battle which witnessed the entire subjugation of the Britons by the Saxons under Cynric, was seized by the Saxons and made into a stronghold, in the same way Chisbury was taken from the Britons by Cisse, the Saxon, fortified, and made his chief post. The water, which lies in the northern part of the moat, to the depth of four feet, was evidently not intended to be there originally; Saxons never appear to have filled their moats with water.

Within the Castle there is a small chapel dedicated to St. Martin, formerly belonging to the parish church of Great Bedwyn, now used as a barn. Its architecture appears to have been a very graceful specimen of the decorated style, and it is mentioned as having been built before the year 1341.

From this Castle the Wans-dyke has been traced southward across the canal, and up the opposite hill, upon which it appears to have almost disappeared, but the few vestiges of it which remain show that it here made a bend eastward, and at a place called Prosperous Farm, three miles south of Hungerford; and, also, at Sadler's Farm it again appears in its more perfect state for a short distance. Beyond this point, I am unable to describe its course, as I have not yet been able to find any further account of it, the traces being so very difficult to determine.

A vote of thanks to T. R. Dumergue, for his services to the Society, was proposed by the President, and seconded by C. M. Bull, Esq., and carried unanimously.

An election was then held to supply the two vacancies in the Committee, and C. M. Bull, Esq., and G. H. Holden, were elected.

Rev. C. W. Tayler was elected an Honorary Member; and H. Manders, W. Greg, and H. Soames, Ordinary Members.

There were 77 persons present: 21 members, 3 honorary members, and 53 visitors.

MEETING HELD OCTOBER 18TH, 1867.

In the absence of the President, the Chair was taken by C. M. Bull, Esq.

Geology.

W. Greg exhibited a specimen of Volcanic Glass, from the Cape of Good Hope.

E. Almack some fossilized Tusks, and

H. A. A'Court a piece of Serpentine.

Entomology.

H. M. Hilton exhibited a box of Brazilian Insects, and

H. Manders some Chinese Beetles.

H. M. Moule, Esq., presented to the Society a work entitled "Wells on Dew."

G. H. Dawson read the following paper on

THE SWALLOW.

I have chosen the swallow as the subject of my paper from the feeling that it is perhaps the bird of all others which is looked upon with the most interest, even by those whose pursuits are not of an ornithological kind. I shall not attempt to treat the subject in a very scientific manner, but I hope I may find something to interest you in the habits of the swallow which have come under my own personal observation. From the days of old, mythology and the tale told by so many of the old poets, of Procné changed into a swallow with blood-stained breast, from the time of the Greek poet Anacreon, who has several odes addressed to the swallow, the bird has been familiar, and has received a friendly greeting from all. Telling us by its welcome twitter of the return of spring, it cannot fail to be one of the most interesting of our migratory birds, and much more so than many of the slender-billed warblers, which return to us about the same time, but which are hardly noticed by most persons from their more retiring habits.

Perhaps in speaking of what may be called the type of migratory birds, it may not be out of place to preface my remarks on it by a few words on the migration of birds generally. Many birds impelled and guided by instinct, acting upon an impulse which, unknown to themselves, and unreflected upon, influences their movements, display habits of periodical migration. Truly wonderful indeed is the instinct, which prompts them when food begins to fail in one country to seek it in distant lands, and which at the same time tells them with unerring accuracy the way to seek those lands. And not less wonderful are the energy and perseverance of these little creatures, which enable them to surpass no small obstacles, and to fly

for miles without rest over land and sea. It seems very strange how the wings of many birds which do not seem adapted for very long flights can carry them such long distances without flagging: the swallow appears to be naturally gifted with considerable powers of flight, but even its wings must be wearied before it has completed its long journeys. With regard to its possible speed of travelling, I find it stated that the swallow is capable of flying 90 miles an hour, and the swift about 180 miles, so they may well put the express train to shame if these accounts are to be relied on, and I should fancy that they cannot be far from the truth.

In spring the swallow and nightingale and numerous other birds leave their winter quarters in Southern Europe, in Asia, in Northern and sometimes in Central Africa, and visit our islands and Northern Europe generally: various other birds on the contrary, and especially water fowl, which find subsistence here in the winter, depart in the spring for the polar regions, where the melting of the ice insures their finding sufficient food. Migration, it seems, is always performed in regular stages, generally during the night, and in most cases by flocks, associated into vast bodies and acting in concert. The males are said to precede the females in a body by themselves, separating on their arrival, select their respective territories, and utter their call-notes to attract the females: this is remarkably apparent in the case of the nightingale and the quail. Some birds, more perhaps than we know of, on their return visit their old homes, and repair their old nests, or build new ones closely adjacent to them: of this the swallow and house-martin are the more prominent examples: it has often been ascertained with certainty that the same bird returns year after year, by catching one of the birds and marking it in some way, the bird returning with its mark the following season. It is in Africa that the swallow takes up its winter quarters; by some it is said to travel as far South as the Cape of Good Hope, but others deny that, and maintain that it confines itself to the tropical regions: coming from these quarters it visits nearly the whole of Europe, and is found even in the most northern countries, such as Lapland, Norway, Denmark, and Sweden: moreover swallows are met with in the colder parts of North America, and it may be noticed that they are apparently not so sensitive to cold as is generally supposed, but seek warmer climes when our winter approaches, compelled rather by scarcity of food than by the severity of the weather.

One interesting question occurs to me on the subject of migration, namely, how many miles is the swallow, or any other migratory bird, capable of flying at a time without rest. It does not seem very easy to find an answer to this. I have mentioned above that the swallow is supposed to be capable of flying 90 miles an hour: but this of course cannot be its travelling speed. Now, to get to Africa from England, it must necessarily cross

the Mediterranean somewhere. Supposing it to traverse the whole of Spain, which, I should think, is not very probable, then the Straits of Gibraltar alone have to be crossed, a distance of only eight miles, a mere nothing. If on the contrary the bird chooses its route only through France, when it gets to the extreme South, say to Marseilles, it has about 500 miles of sea to cross without much chance of getting a rest. This, even at the almost incredible speed of 90 miles an hour, would take more than five hours, and I should think we ought to allow a space of at least ten hours. I have not been able to come to any satisfactory conclusion on the subject, or to find any sufficient account of it, therefore I merely mention it as an interesting subject for enquiry, and should be very glad of any information as to the longest distance that birds are capable of flying, and the longest time that they can remain on the wing. I find that swallows have often been seen, both in autumn and spring, crossing the Mediterranean: sometimes they will take a short rest on the rigging of the ships, and often remain there for a considerable time to recover strength; now and then they dip into the sea, and go on again refreshed by their salt-water bath.

The swallow comes to us as early as any of the other birds of its tribe, arriving about the same time as the martins, and generally a fortnight or three weeks before the swifts. The actual date of its first appearance may vary slightly in different seasons, but the first comers generally find their way here about the first of April, and are soon followed by the main body. "One swallow does not make a summer" as the old proverb says, and we always see that a few stragglers precede the rest by some days. The birds generally appear to be fatigued on their first arrival, and do not begin to employ themselves in nest-building for a week or two, but give their whole attention to hawking for flies, thus recruiting their strength before setting about their work. As long as the summer weather lasts, and food is abundant we have the swallows with us: at some time in the month of October they generally leave us; and then may often be seen gathering together in large flocks before beginning their travels.

Years ago it was supposed by some persons that many, if not all swallows pass the winter in a state of torpor, as in the case with some animals and reptiles, but this has never been proved, as far as I know, with regard to any of the feathered tribes: however, be this as it may, it is certain that swallows and martins may occasionally be seen in warm days even in the depth of winter, which seems to show that some of them must remain with us during the whole year; and some persons have declared that they have seen them descend into hollow trees on these wintry days; and, further, there is an account given on tolerable authority of a pair of martins who had left their breeding until rather late in the season (and therefore could not remove their

young before the winter set in) and who plastered up their nest with mud, and left the young birds to remain there for the winter; according to the account, the young birds came to life again the next spring. With regard to birds hibernating in this way, there are several instances on record of land-rails, which are also migratory birds having been found in the winter in holes in the ground, and these seem more worthy of credit; but even taking for granted the truth of such instances as these, they are after all only the result of circumstances, and are but exceptions to the general rule, difficult as they are to account for. As to the old theory that swallows passed the winter at the bottom of some muddy pool, I think it may be discarded at once. It is not very difficult to see what may have given rise to such a supposition; for hundreds of swallows may often be seen, about the time of their departure, congregated together in flocks, and gathering, as evening comes on, in some osier bed. (I have seen them doing so myself more than once in the osier bed opposite the Master's garden): here they seem for a time to be very restless as though they were quarrelling desparately for the best places, but as it grows dark they gradually settle in quietly for the night, though even then a stone thrown amongst them creates a great uproar. Probably it was upon this fact that the old naturalists built their theory of the birds passing the winter in mud, imagining that the willows were only a stage preparatory to the oozy soil at their roots. Enough however of the migratory and winter residence of our birds; let us now consider them during the time of their stay in our country.

Every one knows the ordinary situations of the swallow's nest, and there is no need to say much on that subject generally: they are sociable birds, and seem to rejoice in the company of man, so that their nests are generally close to some house. Sometimes the bird will choose a strange situation for its dwelling. We have had a nest for some years at home, placed under the cover of a house-bell, in such a position, indeed, that it would not be moved by the ringing of the bell, but still it seems strange that the bird should not be disturbed by so much noise so close to it: despite of this, however, I have reason to believe that they have always succeeded in rearing their brood in safety. I should think it most probable, according to the general opinion, that the same pair of birds, or at least one of the pair, return year after year, to their old abode.

During the past summer I have been much interested by watching a pair of swallows which had built their nest under a verandah just outside our dining-room window, so close that it might easily be reached with the hand from the upper part of the window: the birds seemed to have no sort of objection to be watched provided the window were shut, but if it was left open they showed shyness until the young ones were hatched, and

then they seemed bold enough for anything. The old bird sat on her eggs without any signs of fear, though some one was constantly looking at her: it was when the young birds were hatched that the most interesting time began. At first the parents did not seem to bring them food very often in the day, but when they were nearly fit to leave the nest the visits were most incessant. I determined to watch them one day, and remained doing so for more than half-an-hour, and I found that on an average one of the birds came at least once a minute, the visits amounting to just about six in five minutes. Each bird seemed to have its own beat for searching for food, for invariably they came the same way, one appearing over a garden-wall, and flying straight to the nest for the distance of some hundred yards, whilst the other came from one side, and could only be seen when within a few yards of the nest. Scarcely more than a second was occupied in giving the food, and I noticed that one of the four young birds, perhaps the strongest and most clamorous, seemed to get considerably more than his share; once it struck one of the old ones that he was getting too much, and the attentive father or mother divided the beak-full of flies between it and its next door neighbour; this was the only instance I noticed in which more than one bird was fed at a single visit. When the young birds were able to leave the nest there seemed to be great excitement with the old ones—they taught them first to perch on the branch of a fig-tree close to the nest, and this they did not leave for the purpose of flying any distance on the first day, but after this scarcely anything was seen of the young ones during the day time, though for many days they would invariably return to the nest in the evening and roost in it—then as before the old birds brought them food until it was very nearly dark.

It is remarkable that the swallow and the rest of his tribe do not seem to roost until it is very nearly dark, whilst most birds retire to rest some time before it is even dusk. I suppose the fact is that the evening, especially a calm and still evening, is a remarkably good time for catching flies: and perhaps swallows, as trout, may feel their appetites sharpened about that time. Any one who has stood by the side of a Devonshire trout stream as evening closes in, must have noticed how the water seems to be alive with fish about that time, and these of course are in pursuit of the moths and flies, which begin to appear at dusk.

One can hardly help being struck with the skill with which the swallows and still more the martins attach their nests to such smooth surfaces: it seems quite wonderful how they can make the clay hold properly together, and stick where they want it. Martins, I believe, moisten the mud with a peculiar glutinous fluid from their throats, and very possibly swallows may do the same thing, though I have not been able to find any notice of the kind in their case. We are told that they have been observed to work up long

straws with the mud, as straw is used with bricks, and hair with mortar, their instinct guiding them to the same expedient. Even after the nest is built they have sometimes difficulties of a different sort to contend with, namely thieves, more especially sparrows. These have often been known to take a fancy to a snug-looking martin's nest and, might constituting right, to have expelled the lawful owners; but sometimes the latter have reduced the entrance of their nest to a very small size, just enough to admit themselves and too small for the sparrows. Still more curious is an instance of vengeance taken by a pair of swallows upon a sparrow which had succeeded in possessing himself of their nest. Having made many vain efforts to dislodge the intruder they came one morning, followed by several other swallows, all provided with mouthfuls of clay, and together they contrived to plaster up the entrance hole before the sparrow could effect his escape, and so formed his ill-gotten nest into a prison, where he must either have been smothered or have died of starvation.

Swallows and all the other members of their tribe are entirely insectivorous birds, thus doing a considerable amount of good to man, and no harm whatever. Some idea may be conceived of the vast quantity of flies and insects destroyed by a single swallow by watching an old bird feed its young: almost the whole of the day seems to be occupied without any intermission in the search for food, and according to my calculations mentioned above, a single bird will in about two minutes fill its beak with insects. I find it mentioned that on picking up a swift which had been shot, a number of minute flies and beetles, some mutilated, others scarcely injured, where observed crawling out of the birds beak. The throat seemed to be perfectly stuffed with them, and as many were collected as when pressed close would be contained in the bowl of an ordinary table-spoon. When closely examined the greater part of the minute insects destroyed by these birds will be observed to be of one kind, and it is a curious fact that by far the greater part of those which suddenly fly into our eyes are of the same genus, if not the same species as those which constitute the main part of the swallow's food. It may seem strange at first, but it is a fact, that spiders are devoured by swallows to a great degree. The fact is that the air is filled with a vast number of small spiders, and to a height almost incredible: of the quantity we may form some idea from the perfect carpeting of webs which are sometimes to be seen on an autumn morning. These are the webs of the gossamer spider, which, rendered heavy by the dew collected on their threads, fall to the ground and cover whole acres. Everyone knows the common weather rule that when swallows fly low there will be rain, when high there is a prospect of fine weather. This is of course very easily accounted for; they feed entirely on insects, and the flight of insects depends in a great degree on the state of the atmosphere.

When it is clear and dry they rise; if moist, or likely to be so, they keep nearer the ground, and the swallow in pursuit of them supplies us with an accurate and easily available weather glass. As to the pretensions of this class of birds to receive the name of songsters, the swallow has perhaps the most claim to the distinction: it utters a pleasing kind of twitter when on the wing, and also when perched on the tops of trees. The note of the swift can hardly be called melodious: it utters a kind of sharp scream whilst on the wing, which has earned for it the name of "scritcher" among the Wiltshire rustics. The house and sand-martin utter a low and plaintive note: the latter can hardly be said to sing.

I must not entirely omit to notice the swallows which make the edible nests, dainties so highly esteemed by the Chinese. These birds are remarkably small, so much so, that it takes about 10 of them to weigh 2½ oz. They are found in great numbers in the island of Java, and the nests form an important article of trade among the natives of the island, and fetch a very high price; the cost is from 30 to 42 shillings per pound. The total export per annum consists of about 2,500 pounds. The principal purchasers are of course the Chinese: the way of cooking the peculiar dainty is as follows: a number of nests are cleaned, and put into some earthenware vessel with a duck or fowl, and left over a slow fire for about 24 hours. There are different theories as to the material of which the nest is made, the most fanciful of these is that it is formed of the foam of the sea; another which seems more probable is that it is made of some kind of sea-weed.

G. G. Monck was elected a Member of the Society.

There were 69 persons present at this meeting; 3 hon. members, 21 members, and 45 visitors.

MEETING HELD NOVEMBER 1ST, 1867.

Ornithology.

E. IM THURN exhibited a specimen of the "Tengmalmi Owl," shot in Cornwall.

Entomology.

H. M. HILTON read a list of captures made during the last fortnight.

Archæology.

G. G. MONCK exhibited a coin of Edward I., found in the cricket field, and presented to the Society by Mr. C. Brampton. Also some other coins, and a seal of a monastery, lately presented to the Society.

THE PRESIDENT exhibited, on behalf of J. B. Gilmore, Esquire, an interesting series of remains from the house of a Pictish Chief in the Orkneys, consisting of a deer's antler, bones of sheep and rat, the "land-whelk," and bone implements.

Botany.

THE PRESIDENT exhibited specimens of *Lastrea Borreri*, and *L. Thelypteris*, two ferns new to the College List, and presented by S. Dixon, Esquire, of Pewsey.

Zoology.

THE PRESIDENT exhibited the skin of a Boa-Constrictor, presented to the Society by Mr. F. Velvin..

G. H. HOLDEN then read the following paper, illustrated by diagrams, on

GLACIERS.

It has been observed by Saussure that if a man were raised in a balloon high enough over the mountains of Switzerland and Savoy, he would see several parallel ranges of mountains, of which the centre one would be the highest, and that the tops of the highest mountains would be covered with snow, the sides and declivitives with snow and ice, and that the bottom would be covered with fields of ice. So there is a regular gradation from the snow on the summits, to the ice of the Upper Glaciers, which becomes more compact and solid in proportion as it approaches the Lower Glaciers and amalgamates with them.

Let us now see how Glaciers are formed. There is, you know, a definite line, called the snow line, on all mountains of great height, above which the snow is perpetual; this is at the point where 32°F. is the maximum temperature in summer. Above this line the snow, were melting the only way of removing it, would accumulate, and accumulate so rapidly that in 100 years, according to the calculation of Bishop Rendu, one of the earliest observers of Glaciers, Mont Blanc would be 400 feet higher than it is, and in 1000 years 4000 feet higher. It is obvious, however, that nothing of the kind takes place, partly no doubt because great masses are broken off in the form of avalanches, but chiefly because the greater portion is removed by the Glaciers in the form of *Ice*. For the snow, accumulating above the snow-line, by its pressure gradually, very gradually, changes the snow below the snow-line into solid ice. This pressure is the main agent, yet pressure could not do it alone, just as you cannot make a snowball out of all kinds of snow, for if there is a frost and the snow is dry it will not bind: so too the pressure of the snow above is not by itself sufficient to form the snow below the line into ice, there must be some heat, that is some moisture: accordingly it is not until the temperature is

above 32° F., or, in other words, not until it gets below the snow-line, that it is formed into ice. Above the snow-line we find snow, compressed snow, and below it we find ice, namely the Glaciers. This then is the way in which Glaciers are formed. The next point I would have you observe is that glaciers are rivers—literally rivers, and rivers of ice; and further, that they obey with very slight modifications the same laws that rivers obey; and perform with slight modifications the same work that rivers perform. As many rivers spring from the watershed, so from the snow plateaux on the snow-clad mountains do many glaciers spring. And these glaciers, by their own weight and the pressure from above, very slowly, but quite perceptibly, descend. The Glacier follows the bends of its valley, as the river does those of its bed; it contracts when it has to pass through a gorge, it expands when it has to fill a valley. As a river is fed by many tributary rivers, so a glacier is fed by many small glaciers. Again, as rivers have their waterfalls and torrents, so glaciers have their ice-cascades; and finally, as in rivers, the centre moves more rapidly than the sides, which are retarded by the friction of the valley-banks.

Glaciers always gather into themselves stones and rocks from the mountains that border on their valleys, and they often receive additional burdens of stones from the summits, whence large fragments are constantly falling down, either shattered by lightning or split by the frost: accordingly there is down each side of every glacier, what is called a *moraine*, *i.e.*, a line of rocks and stones that move with it. In due time the glacier receives a tributary, which also has two moraines down its sides; then the two moraines, which are adjacent, meet when the glaciers meet and flow on with it down the middle of what may be called the main stream; the other two moraines still keep on down each side of the main stream. Hence every glacier has two lateral moraines, *i.e.*, down the side, and as many medial moraines as it has received tributaries. Many of these rocks and stones are engulfed in the crevasses and fissures in the ice, which are caused by the uneven bottom, and windings of the valleys. Those stones that remain on the top still keep their angular and rough character, while those that fall into the glacier, generally fall through into the river that runs beneath most of the glaciers, and like all water-rolled pebbles, become rounded and smooth. The rivers that run under the glaciers arise partly from Springs, and partly from the melting of the ice. If the rocks in the stream are at all large they are generally caught up again by the glacier, and so go on scratching and grooving the rocks below them, and being scratched and grooved by them. And further the whole weight of the glacier grinds down and rounds off the surface of the rock beneath, so that we can always see where a glacier has been.

The rocks that are so worn are called *mammillated*. Sometimes like the islands in a river, huge crags will rise in the midst of a glacier, and if the surface of the glacier sinks in course of time, they will often remain crowned with some fragment of rock that they have caught from the moraine of the glacier; and this rock remains perched on the top of the other where nothing but a glacier could have placed it. When the glacier arrives at the valley the sun's rays melt the ice as fast as it is pushed down, so only the stones of the moraines are left, these form what is called the terminal moraine through which the stream that flows from under the glacier takes its course. These terminal moraines are generally very large and contain immense rocks. The glaciers themselves are very large; many of the Swiss ones are 20 miles long, 2 or 3 broad, and 500 or 600 feet deep. The Humboldt Glacier of Greenland is 45 miles broad. I have mentioned that the stream flowing from under the glacier continues to flow on through the terminal moraine; these streams continue to flow on some into rivers, and some become rivers themselves; the Rhone, for instance, flows from a glacier. These streams are of course always very cold, and the Rhone is especially so as it flows direct from a glacier. When bathing in the lake of Geneva I found that the water would for about 3 yards be almost hot from the sun, and then for the next 3 yards perhaps it would be icy cold, from the fact that the Rhone was flowing through it. The passing from hot to cold, and *vice versâ*, when swimming was very curious; sometimes the shoulders and all the upper part of the body would be quite hot and all the rest quite cold.

I visited two glaciers in the past summer the Rosenlaui glacier, and the Upper Grindelwald glacier.

The first of these two has been called the most beautiful glacier in all Switzerland, though it is by no means the largest. We rode from Meyringen in the morning, up one of the most beautiful of mountains, the Great Scheidech; for the greater part of the way we met no one, but, as we were a lively party, it did not matter much. The sides of the mountain are covered with the beautiful little rhododendron tree, improperly called the "Rose des Alpes," [almost the first thing I can remember is two of these little trees in the garden at home, which my father had brought from Monte Rosa, one of them having saved his life on that mountain].

About noon we stopped at one of the hotels that occur at intervals on all the much-frequented Alps; here we left our horses, and diverged for a short distance to visit the *Rosenlaui Glacier*. We walked for some distance, through the rankest profusion of ferns, flowers, and the Rhododendron trees, and despite the heat we were all glad of an opportunity to stretch our limbs. I must not omit here the beautiful blue Gentian, which is the belle of all Alpine flowers. We presently came to a small wooden bridge over a very

narrow chasm. Narrow though it was, we could hardly see the stream which dashed along the bottom, for the depth was enormous, there we found a man waiting, whose business it was to throw huge stones down from the bridge to amuse travellers, for which he expected a franc. We soon came to the terminal moraine of the glacier through which we found a beaten path; before we had gone 200 yards through the moraine we came to a Swiss chalet, full of the Swiss carvings, which you see everywhere through Switzerland, and of the rock-crystals. Having passed this we went on for 300 or 400 yards more through the moraine, and then came to the glacier. When we were still about 100 yards from it the air became quite cold, instead of opressively hot as we had hitherto found it.

Hence we proceeded to the place where the glacier-stream flowed from under it; we found it coming out of a sort of cave in the ice: into this cave we went, and very beautiful it was. The stream came flowing down through it, and the roof above, was ornamented with beautiful stalactites of ice. We went some way up the stream under the ice; it is possible to go right through and come out again higher up, but we did not—I climbed up on to the glacier for a little way, and I found the ice was not smooth and clear as I expected, but all granulated and rough and full of little bubbles about the size of a pea. These crunched at every step. When we returned again to the chalet, I had my alpenstock marked, as is the usual custom wherever you go in Switzerland. We then went on to the hotel where we had left our horses, and having had lunch, went on to *Grindelwald.*

The next day we visited the *Upper Grindelwald* glacier. The difference between this and the previous one was, that in this there had been a long passage cut through the ice, that after many windings ended in a grotto—inside this passage the ice was beautifully clear, and we could see for two or three yards into the glacier.

The dangers of crossing, which are great, are chiefly the following:—

First, the glacier, as I told you is always full of deep, and often, broad chasms, of which some are said to be not less than 500 or 600 feet deep. There is great danger of slipping into these, as the ice, as you all know, does not afford the firmest of footing, even though the men wear *crampons* upon their boots; these crampons are small iron bars with 4 small iron spikes in them. They also carry the *alpenstock*, which is a stout pole with an iron spike at one end; the use of it is to aid you in walking, and also should you slip into a chasm, to hold out horizontally above your head; when, if the chasm is not a broad one, it will often save you. Sometimes you see the tops of the alpenstocks ornamented either with a chamois horn, or with a bunch of the rhododendron flowers.

These great crevasses often get slightly frozen over, by a thin coating of snow; this entirely hides them, so that you may be precipitated into them unawares. Generally, however, the snow about the crevass is much whiter than the rest of the glacier, so you have only to probe it with your alpenstock to see if it is sound or not. When there has lately been a snow-storm, the whole glacier is equally white, and then the danger is much greater. The men tie themselves together with ropes, so that if one falls in, he may be held up by the others.

Another great danger lies in the uneven surface of the glaciers. In some places the descents are so steep, that the only way of getting down is by what is called *sliding*, that is, stooping down and spreading the legs out, and keeping your alpenstock between your legs, behind you, to guide yourself with. There is also another method of *sliding*, viz., putting the two feet close together, and leaning backwards, supporting yourself by your alpenstock. This is the most usual way with travellers, while the natives patronise the other. Very often the slope has only a very small level ridge between it and a chasm some 200 or 300 feet deep. In such cases the way is to stop yourself by sticking the point of the alpenstock in the ice just at the bottom of the slope. I met a gentleman at Geneva who had broken his arm when descending one of these slopes. There had, he told me, been a party of them crossing the glacier, when they had to descend a slope of this sort. They all began to descend in the second manner which I mentioned, and my friend happened to be a little ahead of the rest; when he got near the bottom he saw that there was only a level ridge of about 3 or 4 feet wide, for them to land on, and that between this and the chasm were only a few stones and lumps of ice; accordingly, when he came to the ledge, he threw himself flat down upon the ice and so succeeded in stopping himself: but the whole of the rest of the party came tumbling on the top of him and broke his arm.

The author of "Frost and Fire" has given the following account of a slide down a snow slope. As it can give you a better account than anything I can tell you, I will quote it. He says,

"Now came the descent on the other side. It was not nice going, but following my hunter I got down, and the rest followed us. We scrambled down several broken scaurs, and halted at the top of a snow-slope. It seemed to slant down several thousands of feet till it reached the level of the Grindelwald glacier. I funked desperately, but there was nothing for it but follow my leader. So planting my feet together, and holding the pole behind, I let myself go, and glided down about 300 yards. Here was a bare rock, so we dug the points of our sticks into the snow, and sat down to watch the others. They looked like pigmies craning over the edge. First came the German, and reached the first stone all right; then came the Dane, who lost his footing,

and performed the rest of the journey on his foundation; last came the Russ, who fell flat on his back, and lost his stick and his hat. He might have lost his life also, but for a lucky stone which brought him up. He was too much shaken to try again, so two men took him under the arms for the rest of the way. The hunter cut snooks, cheered, made himself into a tripod again, and started, I followed as best I could, and reached the bottom, hot, but charmed with this new method of travelling. The dandy came in terribly dilapidated; his face was pale, his hands skinned in trying to hold back, his shirt-bands were torn, the heels of his Wellingtons had gone to one side, and his knees shook. So we all sat down and ate and drank vigorously." So you see sliding is not always so pleasant as it looks. On the 28th of February, 1864, a fatal accident happened in the Vallias. A party were sliding down a snow-slope, they moved it and it slid with them, and two were killed in the avalanche.

Another thing to notice is that glaciers all move, and move regularly. I told you that the causes which move them are pressure, slope, and temperature. As to the rate at which they move, M. Ebal states, that in the valley of Chamouni, they travel at about 14 feet a year, while in that of Grindelwald the rate is at about 25 feet a year. This is to be attributed probably to the difference in slope of the ground. The same glacier also will make more progress in one year than in another according to the lesser or greater warmth of the summer of that year. Captain Hall mentions the ploughing up of the ground before the glacier as an obvious proof of its progression. He instances the Benva glacier, which fairly crosses from one side of the valley to the other, and is so irresistibly pressed forward by the weight of snow on its shoulders, that on reaching the opposite side of the valley it travels a considerable distance up the bank.

But they move so regularly, that when, some years ago, a fatal accident happened on one of them, in which three men fell into a crevass and perished, it was calculated by an English professor, that their bodies would appear at the end of a fixed stated period, and sure enough, within a week of the time he had foretold, an arm was seen, shortly afterwards a leg, and soon all the bodies, which were identified by their clothes.

This motion of glaciers gives rise to the extraordinary spectacle, of summer productions and winter formations being sometimes in immediate contact with each other; the ice-field obtruding into flowery meadows, and gradually forcing its way into the regions of cultivation. According to Professor Forbes, the very huts of the peasantry are sometimes invaded by this moving ice, and many persons now living have seen the full ears of corn touching the glacier, and have gathered ripe cherries from the trees with one foot standing on the ice!

The glacier system of the Alps embraces an extensive area. M. Ebal estimates that there may be at least 400 of the larger glaciers, *i.e.*, those varying from 3 to 30 miles in length. The aggregate superficial extent of all those of the Tyrol, Switzerland, Piedmont, and Savoy, is calculated to be not less than 1400 square miles. The greatest breadth of any single one is seldom more than two miles. The thickness varies from 100 to 600 feet.

So then if you were travelling in a country you knew or suspected to have once been subject to the action of land-ice, whether in a small scale, as in the valley-glaciers of Norway and Switzerland, or on a large scale as now in Greenland, where the whole country is, as it were, covered with one great sheet of ice, the signs you should look for would be the following :

α *Mammillated rocks* or, as the French call them, *roches moutonnées*, rocks rounded off by the superincumbent pressure and grinding weight of ice.

β *Blocs perchés* or rocks perched on the tops of others—rocks that are evidently not native to the place where they are found, and where they could not have rolled down to their present position from the heights above (for then they would have bounded on), and where no human skill could have balanced them; but which have evidently been let gently down by ice.

γ *Moraines*, whether lateral in the shape of stones along the slopes of mountains, marking the edges of old glaciers, or terminal in the shape of heaps of stones, deposited at the foot of the glacier, and too large to be carried away by the glacial stream.

δ *Grooves, chiselings, and markings* in the rock, of every depth, size, and character, from the mere scratch to the decided hollow.

It is to be noticed that all these markings and signs are found to this day in a great many countries where there are no glaciers at all, *e.g.* in Scotland and Wales.

I cannot conclude better than with some lines from Coleridge :

Motionless torrents! silent cataracts!
Who made you glorious as the gates of heaven
Beneath the keen full moon? who bade the sun
Clothe you with rainbows? who with living flowers
Of loveliest blue spread garlands at your feet?
God! let the torrents, like a shout of nations,
Answer! and let the ice-plains echo, God!
God! sing, ye meadow-streams, with gladsome voice!
Ye pine-groves, with your soft and soul-like sounds!
And they, too, have a voice, yon piles of snow,
And in their perilous fall shall thunder, God!

There were 68 persons present—17 members, 6 honorary members, and 45 visitors.

MEETING HELD NOVEMBER 15TH, 1867.

Entomology.

H. M. HILTON gave a list of notices, and exhibited a flint sponge, with cavities filled with living specimens of the perfect insect of the rat-tailed maggot *(Helophilus pendulus)*; also nests of the rose-leaf-cutter bee.

Archæology.

G. G. MONCK exhibited some Roman coins found at Pagan's Hole near Bristol, presented to the society by J. C. Brown; a silver denarius of Antoninus Pius, and various other coins.

THE PRESIDENT exhibited a carved walking-stick made from the oak of York Minster.

Geology.

E. ALMACK gave a short description of the orgin of the "grey wethers," and exhibited a specimen of echinus, embedded in flint.

A lecture, illustrated by numerous diagrams and experiments, was then given by W. Fergus, Esq., M.D., on the Ear.

There were 111 present—4 hon. members, 26 members, and 81 visitors.

MEETING HELD NOVEMBER 29TH, 1867.

Archæology.

G. G. MONCK exhibited some coins, among them two Japanese coins, and a rare silver coin belonging to the late Rebel Government in China; also a Japanese box made of straw.

Geology.

W. GREG exhibited some lava from Teneriffe.

Botany.

THE PRESIDENT exhibited the fruit of the prickly pear, a cocoa-nut in the husk, and a double cocoa-nut (*Lodoicea Seychellarum*) from the Seychelles.

H. M. MOULE, Esquire, then gave a lecture on "Corfe Castle and the Isle of Purbeck."

There were 113 persons present—20 members, 5 hon. members, and 88 visitors."

MEETING HELD DECEMBER 13TH, 1867.

Ornithology.

G. H. HOLDEN exhibited seven birds, British and Foreign, presented to the Society by J. W. Parmington.

THE PRESIDENT presented a blue-throated warbler, and exhibited some birds' nests, built of Cud-weed, from Spain.

Entomology.

H. M. HILTON exhibited some Cingalese insects, presented to the Society by A. R. Wiggin.

Zoology.

THE PRESIDENT exhibited some curious oyster-shells, presented by H. H. A'Court.

E. ALMACK exhibited the skull of a bear.

Geology.

E. ALMACK exhibited some fossil bones from the drift in Berkshire.

Botany.

THE PRESIDENT exhibited some minute cocoa-nuts (*Micrococos chiliensis*) from Chili, about the size of ordinary walnuts; also Betel nuts from Siam, Ceylon, and India, together with shell-lime and Sipsiet for eating with them; likewise the capsule of the Brazil nut.

THE PRESIDENT then gave a lecture on "meteorites," illustrated by diagrams, and a large collection of meteorites, kindly lent for the purpose by Mr. J. R. Gregory.

The heads of sections then gave abstracts of their several reports.

G. H. HOLDEN then read the following summary:—

	1867.	Corresponding half-year of 1866.
Number of ordinary meetings.....	8	8
Number of papers read	7	7
Number of exhibitions.....	97	100
Average number of exhibitions per meeting	12·1	12·4
Average number of persons present	81·3	41·3
Average number of visitors present	57·4	24

There were 99 persons present—22 members and 77 visitors.

ENTOMOLOGICAL NOTICES.

The following list is necessarily small, as the School only returned on August 16th; but, nevertheless, a very fair amount was done in the first few weeks of the half-year.

The late dates here recorded of the capture of some few Lepidoptera, whose usual time of appearance is July and the beginning of August, are accounted for by the absence of the School during the time mentioned.

A great number have joined the Entomological section lately, it is only to be hoped that they will shew a good deal of energy in the approaching season.

The names of those whose initials occur in the following list are :—

F. F. B..... F. F. Back.
F. J. C. B..... F. J. C. Boles.
F. W. B..... F. W. Bourdillon.
L. C. ..... L. Chapman.
C. J. C. ..... C. J. Cole.
J. W. D. ..... J. W. Dudding.
J. B. F..... J. B. Fuller.
J. H. ..... J. Hamilton.
A. C. H..... A. C. Hilton.
H. M. H. ..... H. M. Hilton.
C. I..... C. Irwin.
F. J. H. J..... F. J. H. Jenkinson.
A. L. ..... A. Longmore.
G. F. R. ..... G. F. Ruck.
H. M. ..... H. Manders.
G. C. M..... G. C. Manisty.
J. B. O..... J. B. Oakeley.
F. P. ..... F. Playne.
C. A. S..... C. A. Sladen.

Latin Name.	English Name.	Date.	Captor.
	RHOPALOCERA.		
Colias Edusa	Clouded Yellow ...	Aug. 30	C. A. S.
Argynnis Aglaia	Dark Green F. ...	Aug. 21	J. B. F.
Thecla Quercus	Purple Hairstreak (seen)	Aug. 21	F. J. H. J; A. C. H.

HETEROCERA.

Latin Name.	English Name.	Date.	Captor.
SPHINGINA.			
Smerinthus Ocellatus ...	Eyed Hawk (larva)	Sept. 1	J. B. F.
S. Populi...	Poplar H. (do.)	Aug. 31	J. B. O.
S. Tiliæ	Lime H. (do.)	Aug. 20	J. B. F.
Sphinx Ligustri	Privet H. (do.)	Sept. 1	F. W. B.
Chærocampa Porcellus	Small Elephant (do.)	Sept. 1	J. W. D.
BOMBYCINA.			
Orgyia Antiqua	Vapourer	Sept. 5	F. J. H. J.
Diloba Cœruleocephala...	Figure of 8... ...	Sept. 9	Morse.
NOCTUINA.			
Bryophila Perla	Marbled Beauty ...	Aug. 24	G. C. M.
Acronycta Alni	Alder Moth (larva)	Aug. 27	L. C.
Heliophobus Popularis ...	Feathered Gothic	Sept. 3	F. P.
Agrotis Suffusa		Aug. 26	F. J. H. J.
Triphæna Janthina ...		Aug. 28	F. J. H. J.
Anthocelis Lunosa ...	Lunar Underwing	Sept. 28	C. L.
Gonoptera Libatrix ...	Herald Moth ...	Sept. 10	C. A. S.
GEOMETRINA.			
Epione Apiciaria		Aug. 30	J. B. O.
Ennomos Tiliaria			F. J. C. B.
E. Angularia		Aug. 19	A. C. H.
Strenia Clathrata		Aug. 27	A. C. H.
Hibernia Progemmaria...		Oct. 28	A. L.
Cheimatobia Brumata		Nov. 16	J. B. O.
Eupithecia Centaureata		Aug. 24	A. C. H.
Phibalapteryx Polygrammata		Sept. 1	F. J. H. J.
Scotosia Dubitata		Aug. 29	C. T. C.
Cidaria Immanata		Aug. 24	A. C. H.
PYRALIDINA.			
Pyralis Farinalis		Aug. 17	
Botys Verticalis		Aug. 19	H. M. H.
Aphomia Colonella...		Sept. 1	F. J. H. J.

NEW SPECIES.

The two following are new to the College list. The 'Stainton' numbers are prefixed, as they are not to be found in our Calendar.

182	Trichiura Cratægi	Sept. 9	Bred by F. J. H. J., from a pupa found by G. F. R.
208	Cymatophora Diluta	Sept. 12	Taken in Manton Coppice by L. C.

LATEST APPEARANCES.

Vanessa Atalanta... ...	Red Admiral ...	Oct. 29	C. A. S.
V. Urticæ	Small Tortoiseshell	Nov. 3	J. H.
Gonepteryx Rhamni ...	Brimstone B. ...	Nov. 8	H. M.
Vanessa Io	Peacock B.... ...	Nov. 10	C. A. S.
Macroglossa Stellatarum	Humming Bird H.	Oct. 23	J. W. D.
Phlogophora Meticulosa	Angle Shades ...	Dec. 13	F. F. B.

BOTANY.

During the earlier part of the half-year a very fair amount of work was done; two, if not three, new species were added to our list, and a very considerable number of new localities. The subjoined list gives only the more important notices. Plants continued in flower till the beginning of November, but by the end of the first week of that month most of them had been killed by the frost.

Names of those whose initials are given in the list.

G. H. D.	G. H. Dawson.
W. F.	W. Fergus, Esq., M.D.
J. E. H.	J. E. Hilliard.
A. C. H.	A. C. Hilton.
H. M. H.....	H. M. Hilton.
A. P. H.	A. P. Hockin.
F. R. J.	F. R. Jarvis.
F. J. H. J.	F. J. H. Jenkinson.
J. B. O.	J. B. Oakeley.
J. C. P.	J. C. Palmer.
T. A. P.	Rev. T. A. Preston.
G. F. R.	G. F. Ruck.
E. im. T.	E. im Thurn.

NEW SPECIES.

Blue Flea-bane (Erigeron acris), Downs near Dead-man's copse. Sept. 8, G. F. R.

Wild Garlic (Allium oleraceum) side of the Bath road, near the Turnpike Aug. 25, G. F. R.

Borage (Borago officinalis) near Elcot Mill, (probably an escape).

S. B. Dixon, Esq., jun., has also presented specimens of

Lastrea Borreri, from Draycott Copse, near Pewsey.

Lastrea Thelypteris, from Manningford Bruce, near Pewsey, Oct. 1867.

NEW LOCALITIES.

Wild Mignonette	Reseda lutea	Between Four and Five-mile Clumps, Sep. 11, A.C.H. and H. M. H.
Dwarf Mallow ...	Malva rotundifolia... ...	Mildenhall; East Kennett, T. A. P.
Wood Vetch ...	Vicia sylvatica	Wood by Martinsell, Sept. 4, H. M. H.
Agrimony	Agrimonia odorata ...	Ivy's Farm, Aug. 30, T. A. P.
Rose-Bay	Epilobium angustifolium	Wood by Martinsell, Sept. 4, H. M. H.
Enchanter's Nightshade	Circæa lutetiana	Stone-bridge Lane, Marlborough, T. A. P.
Teasel	Dipsacus sylvestris ...	Poulton, Aug. 20, T. A. P.
Corn Chamomile	Anthemis arvensis ...	Ivy's Farm, Aug. 30, E. im T.
Stinking do. ...	Anthemis cotula	Ivy's Farm, Aug. 30, T. A. P.
Dwarf Cudweed	Gnaphalium uliginosum	Ivy's Farm, Aug. 30, T. A. P.
Chicory	Cichorium intybus ...	Martinsell, Aug. 20, J. B. O. and F. R. J.; Railway, near Ivy's Farm, Aug. 30, E. im T.
Nettle-leaved Bell-flower	Campanula trachelium...	Forest Hill, Sept. 12, A.C.H. and H. M. H.
Viper's Bugloss ...	Echium vulgare	Railway near Ivy's Farm, Aug. 30, E. im T.
Water Bistort ...	Polygonum amphibium	Water meadows, Poulton, Aug. 20, J. C. P. and E. im T.
Ladies' Tresses ...	Neottia spiralis	Between Four and Five-mile Clumps, Sep. 11, A.C.H. and H.M.H.
Toad-Rush	Juncus bufonius	Elcot Mill, Aug. 30, E. im T.
Bulrush	Scirpus lacustris	Mildenhall, T. A. P.
Common Spleenwort	Asplenium trichomanes	Wall of St. Peter's Church, Marlborough, G. F. R.

OTHER NOTICES.

Water Crowfoot...	Ranunculus heterophyllus	fl. Aug. 21, E. im T.
Soapwort	Saponaria officinalis ...	only in bud Aug. 20, E. im T.
Wood Vetch ...	Vicia sylvatica	fl. Aug. 28, West Woods, A. P. H. and J. E. H.
Strawberry... ...	Fragaria vesca	fl. Nov. 5, E. im T. and J.C.P.
Barren Strawberry	Potentilla fragariastrum	fl. Nov. 4, E. im T.
Raspberry	Rubus Idæus	fl. Oct. 25, W. F.
Pear (cultivated)		fl. Sept. 22, Mrs. Bradley.
Apple (cultivated)		fl. Sept. 22, G. H. D; Oct. 25th, W. F.
Ivy	Hedera helix	fl. by Sept. 11, T. A. P.
Bur-Marigold ...	Bidens cernua	fl. Oct. 1, E. im T.
Corn Marigold ...	Chrysanthemum segetum	fl. Sept. 24, E. im T.
Felwort	Gentiana amarella... ...	very few fl. out, Aug 20.
Field Gentian ...	Gentiana campestris ...	only young buds, Aug. 30, E. im T.; Marlborough Common, Sep. 6, T.A.P.
Black Mullein ...	Verbascum nigrum ...	first fl. Aug. 21, F. J. H. J.
Red Rattle... ...	Pedicularis sylvatica ...	Sept. 30, E. im T.
Primrose	Primula vulgaris	Sept. 11, T. A. P.
Cowslip	Primula veris...	fl. Nov. 5, E. im T. and J.C.P.
Colchicum	Colchicum autumnale ...	fl. Aug. 28, A. P. H. and J. E. H.
Arrow-grass ...	Triglochin palustre ...	not visible where it was plentiful last year.

TREES LEAFLESS.

Lime	Oct. 20.
Horse Chestnut...	Oct. 27.
Hawthorn	Nov. 12.
Pear	Oct. 26.
Red Currant	Oct. 26.
Ash	Oct. 25.
Field Elm	Oct. 28th to Nov. 12.
Lombardy Poplar	Oct. 29.
Oak	Nov. 12.

ORNITHOLOGICAL NOTICES.

Fieldfare	...	...	seen	September 29th	E. im Thurn.
Swallow	...	...	seen	November 16th	G. H. Dawson.

NEW SPECIES.

Since the publication of the list of the birds mentioned in the "Flora of Marlborough," four or five years have passed, in the course of which several birds have been observed in this neighbourhood. The following is the list of those additional notices which we have been able to obtain.

1.—White-tailed Eagle, one shot in Savernake Forest in 1859.
2.—Rough-legged Buzzard, one caught at Overton in 1866.
3.—Peregrine Falcon, said not to be uncommon on the Downs.
4.—Hen Harrier, one shot in Savernake Forest in 1862.
5.—Common Buzzard, several specimens observed in 1865.
6.—Common Kite, a pair built for some years at the same place, on the further side of Martinsell.
7.—Golden Plover, visits us in severe winters.
8.—Green Sandpiper, several flocks observed in the neighbourhood.
9.—Grey Phalarope, one shot at East Kennet in 1866.
10.—Lesser black backed Gull, occasionally met with.
11.—Arctic Tern, observed on the canal at Savernake.
12.—Golden Eye, one specimen shot at Mildenhall.
13.—Widgeon, not uncommon.
14.—Bohemian Waxwing, observed at Draycot in 1864.
15.—Red-necked Grebe, one obtained at Preshute some years ago.
16.—Little Auk, one shot on the Kennet in 1864.
17.—Greater spotted Woodpecker, not uncommon.

Besides these there is one bird, the great Bustard, which we may claim as having once belonged to our Marlborough list, though it has in all probability become extinct, we may almost say in England, for many years. In a paper read before the Wilts Archæological Society, are recorded the two last instances of its occurrence in this neighbourhood, one in Savernake Forest in the year 1849, the second two years later at Chiseldon. There are also two birds, which, it is to be feared, are completely lost to us, the Raven and the Nightingale.

MUSEUM REPORT.

GEOLOGICAL COLLECTION.

This has been enriched by a valuable collection of fossil fish, from the Orkneys, some relics from a Pict's house in the Orkneys, both by J. B. Gilmore, Esq., and a collection of fossil sponges by the late W. Bartlett, Esq.

MINERALOGICAL COLLECTION.

In order to complete a good representative collection, the following minerals are required—Meteoric Iron, Meteorite, Copper Nickel, Radiated Pyrites, Rocksalt (crystallized), Emery, Ilmenite, Cervantite, Zircon, Scapolite, Epidote, Lepidolite, Leucite, Glassy Feldspar, Graphic Granite, Kaolin, Petalite, Lievrite, Meerschaum, Allophane, Scheelite, Wulfenite, Wolfram, Alunite, Websterite, Apatite.

Towards the cost of these F. Storr, Esq., has given 5s.

ENTOMOLOGICAL COLLECTION.

The collection of Moths and Butterflies has been enriched by a donation of specimens from the Rev. J. Greene—with that exception there have been but few additions. In accordance with a wish expressed by many kind Friends a list of our desiderata is given below. In order to prevent this list being too long, none but the names of those species of which we have no representative are mentioned, and even these only to the end of the Noctuæ. As there are but few complete series, almost any specimens will be acceptable.

BUTTERFLIES.

Colias Hyale
Pieris Daplidice
Vanessa Antiopa
Argynnis Lathonia
Melitæa Athalia
Thecla Pruni
Chrysophanus Dispar
" Chryseis
Polyommatus Acis
" Arion
Steropes Paniscus
Pamphila Actæon

SPHINGES.

Procris Globulariæ
Sphinx Pinastri
Deilephila (all)
Chærocampa Nerii
" Celerio
Sesia Bombyliformis
Sphecia Bembeciformis

and all the Trochiliums, except Tipuliforme,
Myopæforme and Formicæforme.

BOMBYCES.

Hepialus Sylvinus
Cerura Bicuspis
" Bifida
Notodonta Dromedarius
" Tritophus
Ptilophora Plumigera
Drymonia Dodonæa
" Chaonia
Gluphisia Crenata
Leiocampa Dictæoides
Diloba Cæruleocephala
Peridea Trepida
Psilura Monacha
Hypogymna Dispar
Dasychira Fascelina
Leucoma Vau-nigrum
Lithosia Aureola
" Pygmæola
" Muscerda
Nudaria Senex
Spilosoma Papyratia
Eulepia Grammica
" Cribrum
Deiopeia Pulchella
Lasiocampa Trifolii
Eriogaster Lanestris
Clisiocampa Castrensis
Platypteryx Lacertinaria
Drepana Sicula
Psyche (all)

NOCTUÆ.

Cymatophora Duplaris
" Fluctuosa
" Diluta
" Ocularis
" Ridens
Acronycta Tridens
" Leporina
" Strigosa
" Alni
" Salicis
" Myricæ
Synia Musculosa
Leucania Vitellina
" Straminea
Melania Flammea
Senta Ulvæ
Nonagria Despecta
" Concolor
" Helmanni
" Cannæ
" Typhæ
„ Crassicornis
Hydræcia Petasitis
Axylia Putris
Xylophasia Lithoxylea
" Scolopacina
Xylomyges Conspicillaris
Laphygma Exigua
Neuria Saponariæ
Pachetra Leucophæa
Luperina Dumerilii
Mamestra Anceps
" Furva
Apamea Connexa
" Gemina
" Ophiogramma
„ Fibrosa
Miana Expolita
Hydrilla Palustris
Caradrina Alsines
Agrotis Fennica
" Corticea
" Ripæ
" Obelisca

Agrotis Agathina
" Ashworthii
Triphæna Subsequa
Noctua Depuncta
" Rhomboidea
" Sobrina
Tæniocampa Leucographa
Orthosia Suspecta
Cerastis Erythrocephala
Hoporina Croceago
" Aurago
Cirrœdia Xempelina
Tethea Retusa
Euperia Fulvago
Cosmia Pyralina
Eremobia Ochroleuca
Dianthœcia Cucubali
" Albimacula
Hecatera Dysodea
Epunda Lutulenta
" Nigra
Valeria Oleagina
Miselia Bimaculosa
Hadena Satura
" Assimilis
" Rectilinea
Cloantha Perspicillaris
Xylina Rhizolitha
" Petrificata
Cucullia Scrophulariæ
" Absinithii
" Chamomillæ
Calophasia Linariæ
Charicles Delphinii
Heliothis Peltigera
" Armigera
" Scutosa
Anarta Melanopa
Acontia Luctuosa
Erastria Venustula
" Fuscula
Micra Ostrina
Brephos Notha
" Bractea
Plusia Illustris
Ophiodes Lunaris

BOTANICAL COLLECTION.

No further additions have been made to the collection. Among the more important desiderata may be mentioned Ranunculus floribundus, Glaucium violaceum, Draba rupestris, Polygala uliginosa, Moenchia ciliata, M. saxatilis, Arenaria norvegica, Stellaria cerastoides, Medicago sylvestris, Trifolium Molinerii, T. glomeratum, Rosa Wilsoni, R. involuta R. Sabini, R. sepium, Epilobium rosmarinifolium, Saxifraga cæspitosa, S. affinis, Astrantia major, Œnanthe silaifolia, Œ. fluviatilis, Tordylium maximum, Daucus maritimus, Coriandrum sativum, Galium Anglicum, Fedià carinata, Sonchus palustris, Arnoseris pusilla, Carduus Forsteri, Centaurea nigrescens, Gnaphalium norvegicum, Filago apiculata, Senecio paludosus, Cineraria palustris, Menziesia cærulea, Verbascum floccosum, V. Blattaria, Veronica verna, Orobanche caryophyllacea, O. amethystea, O. Picridis, Teucrium Scordium, Lamium intermedium, Galeopsis ochroleuca, Pinguicula alpina, Utricularia, intermedia Cyclamen hederæfolium, Statice binervosa, Chenopodium urbicum, C. botryodes, C. glaucum, Rumex Pratensis, Euphorbia Stricta, Spiranthes cernua, Epipactis media, Epigogium aphyllum, Orchis laxiflora, O. militaris,

O. tephrosanthos, Ophrys aranifera, Liparis Loeselii, Cyprepedium Calceolus, Sisyrinchium anceps, Allium Babingtonii, A. Scorodoprasum, A. Schœnoprasum, Convallaria Polygonatum, Potamogeton flabellatus, P. gracilis, P. longifolius, P. heteropyllus P. oblongus, Zostera nana, Sparganium minimum, Juncus diffusus, J. biglumis, Scirpus carinatus, S. triqueter, S. Watsoni, S. parvulus, Carex curta, C. Vahlii C. canescens, Phleum asperum, Arundo stricta, Glyceria Borreri Poa laxa, P. cæsia, Festuca arundinacea, Woodsia ilvensis.

ORNITHOLOGICAL COLLECTION.

During the last few months some important additions have been made to the Society's collection of birds. This having been fairly set on foot, and a commodious cabinet having been purchased for the preservation of the specimens, it is hoped that others may be induced to follow the example of several very liberal Donors. Though there are obvious advantages in having the specimens properly stuffed and set up, yet for several causes, principally on account of the great expense incurred, it has been determined, for the present at least, to preserve merely the *skins* of the majority of the birds. These will therefore be as welcome as stuffed specimens, though there is now accommodation for the careful preservation of the latter.

The collection at present consists of specimens of the following birds :—

Falco Tinnunculus ...	Kestrel (2)	E. im Thurn
Falco Nisus	Sparrow Hawk (2) ...	E. im Thurn G. H. Dawson
Falco Rufus	Marsh Harrier ...	E. im Thurn
Strix Aluco	Tawny Owl (2) ...	Rev. J. F. Bright
Strix Flammea ...	Barn Owl (2)	Rev. J. F. Bright
Strix Otus	Long-eared Owl ...	Rev. T. A. Preston
Corvus Corax	Raven	J. B. Gilmore, Esq.
Corvus Frugilegus ...	Rook (2)	Rev. J. F. Bright E. im Thurn
Garrulus Pica	Magpie (2)	Rev. T. A. Preston
Garrulus Glandarius ...	Jay (2)	Rev. T. A. Preston
Sturnus Vulgaris ...	Starling (2)	Rev. J. F. Bright
Lanius Colurio ...	Redbacked Shrike ...	Rev. J. F. Bright
Turdus Viscivorus ...	Missel Thrush (2) ...	E. im Thurn
Turdus Pilaris	Fieldfare (2)	E. im Thurn
Turdus Musicus ...	Song Thrush (2) ...	E. im Thurn
Turdus Iliacus	Redwing (2)	E. im Thurn
Turdus Torquatus ...	Ring Ouzel	Rev. T. A. Preston
Turdus Merula	Black Bird	Rev. J. F. Bright
Sylvia Suecia	Blue throated Warbler ...	Rev. T. A. Preston
Sylvia Phœnicurus ...	Redstart	J. W. Parrington

Sylvia Trochilus ...	Willow Warbler ...	Rev. J. F. Bright
Regulus Cristatus ...	Golden-crested Wren (2)	Rev. T. A. Preston
Troglodytes Vulgaris ...	Common Wren (2) ...	Rev. J. F. Bright
Accentor Modularis ...	Hedge Accentor (2) ...	Rev. J. F. Bright
Parus Cæruleus ...	Blue Tit (2)	Rev. J. F. Bright
Emberiza Citrinella ...	Yellow Hammer (2) ...	Rev. J. F. Bright
Emberiza Nivalis ...	Snow Bunting	J. W. Parrington J. B. Gilmore, Esq.
Pyrrhula Vulgaris ...	Bulfinch	Rev. J. F. Bright
Fringilla Coccothraustes	Hawfinch (2)	
Fringilla Cælebs ...	Chaffinch (2)	Rev. J. F. Bright
Fringilla monti-fringilla	Brambling (4)	Rev. T. A. Preston. Rev. J. F. Bright.
Fringilla Montium ...	Mountain Linnet (2) ...	J. B. Gilmore, Esq.
Fringilla Spenus ...	Siskin	J. W Parrington.
Fringilla Linaria ...	Common Redpole ...	J. W. Parrington.
Cuculus Canorus ...	Cuckoo (2)	Rev. J. F. Bright. J. W. Parrington.
Picus Viridis	Green Woodpecker (2) ...	Rev. J. F. Bright. E. im Thurn.
Sitta Europæa	Nuthatch	Rev. J. F. Bright.
Alcedo Ispida	Kingfisher (3)	Rev. J. F. Bright. G. H. Dawson.
Caprimulgus Europæus	Goatsucker	Rev. T. A. Preston. E. im Thurn.
Phasianus Colchicus ...	Common Pheasant (4) ...	Mr. G. Gauntlet.
Perdix Cinereia	Partridge	E. im Thurn.
Perdix Rubra	Red-legged Partridge (2)	E. im Thurn.
Hœmatopus Ostralegus...	Oyster catcher	J. B. Gilmore, Esq.
Charadrius Pluvialis ...	Golden Plover	J. B. Gilmore, Esq.
Charadrius Hiaticula ...	Ringed Plover (2) ...	J. B. Gilmore, Esq.
Vanellus Cristatus ...	Lapwing (2)	J. B. Gilmore, Esq. G. H. Dawson.
Ardea Cineria	Common Heron... ...	Rev. T. A. Preston.
Ardea Stellaris	Common Bittern ...	Rev. T. A. Preston.
Fringa Variabilis ...	Dunlin (2)	J. B. Gilmore, Esq.
Fringa Maritima ...	Purple Sandpiper (2) ...	J. B. Gilmore, Esq.
Machetes Pugnax ...	Ruff (2)	Rev. T. A. Preston.
Totanus Calidris... ...	Common Redshank (2)	J. B. Gilmore, Esq.
Scolopax Gallinago ...	Common Snipe (2) ...	J. B. Gilmore, Esq.
Scolopax Gallinula ...	Jack Snipe (2)	J. B. Gilmore, Esq.
Rallus aquaticus... ...	Water Rail (2)	Rev. T. A. Preston
Crex-pratensis ...	Land Rail	E. im Thurn.

Gallinula Chloropus ...	Moorhen (2)	Sergeant Haggis. Rev. J. F. Bright.
Fulica Atra	Common Coot	Rev. T. A. Preston.
Phalaropus Lobatus	Grey Phalarope	Mr. J. Coleman.
Sterna Arctica	Arctic Tern	E. im Thurn.
Larus argentatus	Herring Gull (2)	J. B. Gilmore, Esq.
Larus Marinus	Great black-backed Gull	J. B. Gilmore, Esq.
Larus Flavipes	Lesser black-backed Gull	J. B. Gilmore, Esq.
Larus Lanus	Common Gull	J. B. Gilmore, Esq.
Larus Tridactylus	Kittiwake	E. im Thurn.
Thalassidroma Procellaria	Storm Petrel (2)	J. B. Gilmore, Esq. J. W. Parrington.
Anas Acuta	Pintail duck	Rev. T. A. Preston.
Anas Fusca	Velvet Scoter (2)	J. B. Gilmore, Esq.
Mergus Serrator	Redbreasted Merganser(3)	J. B Gilmore, Esq. J. W. Parrington.
Carbo Cormoranus	Cormorant	J. B. Gilmore, Esq.
Calymbus Glacialis ...	Great Northern Diver ...	J. B. Gilmore, Esq.
Uria Troile	Guillemot (2)	J. B. Gilmore, Esq.
Uria Grylle	Black Guillemot (3) ...	J. B. Gilmore, Esq.
Mormon Fratercula ...	Puffin (2)	J. B. Gilmore, Esq.
Alca Torda	Razor Bill (2)	J. B. Gilmore, Esq.

ROMAN COINS.

PRESENTED BY J. C. BROWN,

A silver denarius of Antonius Pius
A copper coin of ditto
Ditto Faustina
Ditto Commodus
Two of the Republic, and seven of which the inscriptions are unintelligible.

ENGLISH COINS.

Shilling of Charles II (1668)
Ditto Anne (1711)
Silver threepence of George II (1740)
Penny of William and Mary (1601)
Silver sixpence of George II (1757)
Groat of Edward I, by Mr. C. Brampton
Ditto of Richard II

Silver coin of Louis XV (1757)

THE WEATHER.

	Mean height of Barometer.		Monthly range.		Mean temperature of air.		Mean daily range.		Maximum in shade.		Minimum in shade.		Maximum in Sun.		Minimum on Grass.		Mean degree of Humidity		Mean amount of Cloud.		Amount of Rain.		No. of days on which it fell.	
	1867	1866	1867	1866	1867	1866	1867	1866	1867	1866	1867	1866	1867	1866	1867	1866	1867	1866	1867	1866	1867	1866	1867	1866
	in	in	in	in	°	°	°	°	°	°	°	°	°	°	°	°					in	in		
JULY	29·432	29·483	0·996	0·976	58·3	59·4	19·0	18·2	77·6	83·2	39·2	40·3	134·5	139·8	32·0	31·2	78.0	76·1	6·9	6·8	4·046	1·574	19	12
AUGUST...	29·527	29·349	0·502	0·736	60·0	57.5	19·7	17·0	83.1	74·6	40·1	38·7	143.3	136·0	35.1	30·0	76.0	76·8	6·5	7.5	2·580	3·069	12	21
SEPTEMBER	29·617	29·262	0·740	0·852	56·1	54·1	16·1	12·3	76·7	70·7	32·4	37·1	131·6	119·3	29·2	27·0	82.2	90·4	7·1	8·3	2·324	7·068	15	29
OCTOBER...	29·458	29·625	1·000	0·810	49.0	51·0	15·9	11·8	66·6	67.6	28·1	30·2	109·8	119·0	20·4	24·0	87.8	89·0	7·2	7·9	3·548	1·793	25	16
NOVEMBER	29·838	29·498	1·113	1·022	39·7	44·0	15·7	13·6	58·4	57·9	20·6	25·6	97·3	97.8	12·8	18.8	84.9	87·2	6·4	7·1	1·493	3·102	7	18
DECEMBER	9·5 64	29·482	1.406	1·210	37.3	42·6	13·8	11·6	65·8	56.3	17 7	23·1	75·0	76·0	13·7	20·0	95·9	90·4	6·7	7·6	1·620	3·312	11	23
MEAN.....	29·573	29·448	0·959	0.934	50·1	51·4	16·7	14·1	...	...	...	...	...	...	...	...	84·1	85·0	6·8	7·5	...	...	...	...

Total amount of rain during the six months in 1867—15·611 inches; in 1866, 19·918 inches.
Total amount of rain during the year 1867—33·042 inches; in 1866, 38·052 inches.

ACCOUNTS.

Receipts.

	£	s.	d.
Balance from last half-year	4	6	6
Subscriptions	5	1	0
Donations	2	17	0
Ditto for Bird Cabinet...	2	16	9
Ditto for album	0	15	0
Ditto for minerals	0	5	0
Sale of Report—Midsummer, 1867.	27	16	0
Sale of Back Reports...	1	4	0
	£45	4	9

Expenditure.

	£	s.	d.
Banking book	0	0	6
Balance of Printing account, Midsummer ...	0	5	6
"Geologist"—6 months	0	6	9
Candles	0	6	0
Album	1	10	0
Pair of Hawfinches	0	4	0
Lower Half of Bird Cabinet	7	17	0
For Minerals	0	5	0
Book Account	1	2	6
Balance due for "Zoologist"	8	0	0
Carriage of Box	0	2	10
Postage	0	3	4
Mr. Hillier's account	0	14	0
Printing Report for Midsummer	20	0	0
Ditto Notices	0	18	0
Balance in hand	3	8	10
	£45	4	9

LIST OF DONATIONS.

	£	s.	d.
Mr. Stubbs, Henley-on-Thames	0	10	6
Mrs. Keeling, Bury St. Edmunds	0	5	0
A. Armstrong, Esq.	0	2	6
Image	0	2	6
J. F. Vernon	0	1	0
Harrison	0	0	6
Alford	0	1	0
H. M. Hilton...	0	1	6
A. Babington, Esq.	1	0	0
F. W. Head	0	2	6
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E. Maitland	0	2	6
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C. St. J. Beauclerk	0	1	0
L. Chapman	0	0	6
P. Leach	0	1	0
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Lloyd	0	1	0
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E. Estcourt	0	0	6
G. E. Manisty	0	1	0
A. C. Hilton	0	0	6
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G. H. Dawson	0	10	0
Rev. T. A. Preston	0	10	0
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MARLBOROUGH :
C. PERKINS, PRINTER, TIMES OFFICE.

F. Madan.
Aug. 1868.

REPORT

OF THE

MARLBOROUGH COLLEGE

Natural History Society,

FOR THE

HALF-YEAR,

ENDING MIDSUMMER, 1868.

"Tum mihi Naturæ Libeat perdiscere mores:
Quis Deus hanc mundi temperet arte domum."

MARLBOROUGH:
Printed by C. Perkins, Times Office.
1868.

28.12.88

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PREFACE.

One usually has to qualify the general report of a Society's proceedings by a few dark shades, however bright may be the general effect. And, whether it is necessary or not to do so, one inclines, as a matter of prudence, to look out for the darker shades. In our report for this half-year, however, we have (whether we like it or not) simply and absolutely to chronicle successes. Our field-days, at Ramsbury and Chiseldon, have worked, on the whole, well: our foreign correspondence has been enlarging to a promising and interesting extent. The response to Mr. Preston's kind and well considered offer of prizes was thoroughly good in quality; in quantity it was impossible to anticipate much. Mr. Storr originated, and the Master seconded, the foundation of two prizes for the present year, to be awarded for the largest collection of different sorts of wild plants that should be made within the whole holiday. More than fifty competed; and Macquoid, the winner of the prize, collected no fewer than 104 sorts. Collections generally have been vigorous, and the donations shall speak for themselves; we have to thank Professor Oliver, for a collection of Minerals; the venerable Professor Sedgwick, for a collection of Fossils; Rev. H. Baber, a firm friend of the society, for one of British Plants; H. W. Mercer for one of British Eggs; E. im Thurn, for one of British Nests; G. G. Monck, for one of Coins; J. Pole, for one of British Moths and Butterflies; F. Giles, for several interesting specimens from the Niagara Falls; Mr. Nicholls, of Kingsbridge,

for twelve Devonshire Birds; Mr. Baker, of Cambridge, for the model of an Auk's Egg; Mrs. Gray, for a bottle of Nutmeg Fruit; Mr. P. G. Wayman, for specimens of Iceland Spar; C. Lawson, for the egg of a White-tailed Eagle; M. H. Smith, for a Hawk and Heron; W. W. Dayman, A. C. Almack, and J. W. Mills, for presents of books; G. H. Dawson, for Bates' *Naturalist on the Amazons*; Miss Corrie, for Darwin's *Plants and Animals under Domestication*; G. F. Miles for specimens of Ancient Pottery; Rev. H. Bell, for the valuable gift of Stainton's *Manual of Moths*. Last not least, we have to thank the President, for a pair of the Greater Spotted Woodpecker: Mr. Gilmore, for the munificent addition of Orkney Fossils to his former gift of Orkney Birds, a gift which calls for special and most grateful mention; H. R. H. Prince Leopold and the Rev. Robinson Duckworth, for very kind presents of two copies of Clark-Kennedy's *Birds of Berks and Bucks*. Let us continue to hope that genuine and vigorous exertion will succeed in maintaining and promoting for our Society the position it has now gained.

LIST OF MEMBERS.

PRESIDENT.

REV. T. A. PRESTON.

SECRETARY.

G. H. DAWSON.

TREASURER.

REV. T. A. PRESTON.

LIBRARIAN.

E. ALMACK.

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G. HOLDEN.
E. IM THURN.

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G. H. DAWSON.
G. HOLDEN.

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H. J. VERRALL.
P. L. HESKETH.
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RULES.

1.—That this Society be called the Marlborough College Natural History Society.

Constitution.

2.—That the Society consist of Members and Honorary Members.

Officers.

3.—That the Officers of the Society consist of a President, Secretary, Treasurer, and Librarian, to be elected from and by Members of the Society.

Management.

4.—That the affairs of the Society be conducted by a Committee, consisting of the President, Secretary, and three other members of the Society, to be elected from and by Members of the Society; three of whom shall form a Quorum.

President.

5.—That in case of an equality of votes, the President shall have a double or casting vote.

6.—That in the absence of the President, the Committee be empowered to request any member of the Society to take the chair.

Committee.

7.—That on the occurrence of any election, each member of the Committee have double the number of votes of any other Member of the Society.

8.—That two Members be appointed half-yearly by the Society, to assist the Secretary in Editing the Report.

Secretary.

9.—That the duties of the Secretary be to keep a list of all the Members of the Society, and of all former Members and Benefactors who may wish to receive the Reports of the Society; to summon meetings (when necessary) of the Society; to keep a detailed report of the proceedings, as well as lists of Members and Visitors present at each meeting, and generally to act under the direction of the Committee in all matters connected with the welfare of the Society.

10.—That in the absence of the Secretary from any meeting of the Society, minutes of the proceedings be taken by a member of the Committee, appointed by the President.

Treasurer.

11.—That the duties of the Treasurer be to collect all sums of money due to the Society; to receive all donations of money; and to disburse all sums payable by the Society out of the funds entrusted to him.

12.—That the Treasurer furnish half-yearly a detailed account of the receipts and disbursements to be audited by the Committee.

13.—That the funds of the Society be placed in the College Bank, and that no money be withdrawn by the Treasurer without the signature of the President to the order; or in his absence that of the Secretary.

Librarian.

14.—That the duties of the Librarian be to keep a catalogue of the Library, with the names of the donors; to see that the Library Regulations are carried into effect; to be responsible for the order of the Museum, and when necessary to assist the Secretary in the distribution of the Reports of the Society.

Library.

15.—That any Member of the Society be at liberty to consult any of the books belonging to the Society, but that only certain volumes, to be decided on by the Committee, be allowed to be taken from the room.

16.—That if any member wishes to take a volume from the Museum, he shall give his name, and the name of the book, to the Librarian, who shall enter them in the book kept for the purpose.

17.—That every volume so taken out be returned by the end of the quarter, but that no book be kept more than one month.

18.—That if any volume be damaged, such damage shall be reported by the Librarian to the Committee, who shall decide upon any further proceeding in the matter.

Museum.

19.—That any member of a section, who is not a Member of the Society, be allowed access to the Museum at such times as it is open to Members of the Society generally, provided he first obtain leave from the President, which leave shall be renewed every quarter, but may be taken away at any time, if the privileges be abused in any manner.

20.—That the same privileges be extended, under the same conditions, to such other Members of the School who may wish to use the Library and Collections for the purposes of study, provided there be a reasonable excuse for their not belonging to a section.

21.—That in all cases the Museum be used for the study of Natural History alone, and not as an ordinary Reading Room.

Members.

22.—That the election of new Members rest entirely with the Committee.

23.—That every Member pay a half-yearly subscription of 2*s.* 6*d.*, to be paid at the first meeting of the Society in that half-year.

24.—That if a member be elected at, or after the Quarter, he shall only pay 1*s.* on Election.

25.—That Members have the right to be present, to state their opinions, and to vote at all general meetings of the Society; to introduce a visitor at general meetings of the Society; to have personal access to, and to introduce a visitor to the Museum; and to have a copy of the Report half-yearly.

Visitors.

26.—That on such occasions when the number of those who wish to be present as Visitors at the general meetings of the Society is greater than the number of members who attend, the President and Committee shall be empowered to admit two or more each, as shall seem fit.

Honorary Members.

27.—That Honorary Members have all the privileges of Members, except the power of introducing a member of the School to the meetings of the Society.

Suspension of Members.

28.—That any member be liable to be excluded from the Society by the Committee if, in their opinion, he shall have failed to show sufficient energy in the working of the Society.

Sections.

29.—That sections be formed for the more accurate study of the different branches of Natural History, and that the Heads of these sections be chosen by the Committee half-yearly from Members of the Society.

30.—That these sections shall hold meetings as often as shall seem fit to the Heads of the several sections, at which any member of the School, with the sanction of the Head of that section, may attend.

Meetings.

31.—That ordinary meetings of the Society be held once a fortnight, but that the Secretary be empowered to call extraordinary meetings when necessary.

New Rules.

32.—That any Member of the Society have power to propose any new rule or any alteration in an old one, provided the motion be seconded by another Member.

MEETING HELD FEBRUARY 21st, 1868.

THE following donations were announced, and thanks ordered to be given to the Donors:—

A box of Orkney fossils, by J. B. Gilmore, Esq.

A collection of minerals, by Professor Oliver, F.R.S.

A collection of 12 stuffed birds, by Mr. Nicholls, of Kingsbridge, Devon.

A Sparrow-hawk (*A. Nisus*) by M. H. Smith.

A model of the Egg of the Great Auk (*Alca impennis*) by Mr. Baker, Cambridge.

Egg of the white-tailed Eagle (*Heliœetus albicilla*) by C. E. Lawson.

A pair of the Great Spotted Woodpecker (*Picus major*) shot at Mildenhall, by the President.

Fruit of the Nutmeg (*Myristica moschata*) by Mrs. Gray, of the British Museum.

Specimen of Iceland Spar, by P. G. Wayman, Esq.

Elephant's Tail, by C. Irwin.

Skins of Opossum and Hudson's Bay Rat, by E. C. Sewell.

Two collections of coins, by H. S. Dickinson and W. H. Churchill.

EXHIBITIONS.

Collections of Coins, by E. Almack and M. H. Smith.

Sticks and leaves coated with iron from Northamptonshire, by H. M. Hilton.

A collection of *Echini* from the Chalk in Berkshire, by E. Almack.

A collection of Insects and a Ringed Snake from the Cape of Good Hope, by E. L. Hesketh.

A highly interesting lecture was given by C. M. Bull, Esq., on Celts, illustrated by a large collection of specimens, lent for the purpose by T. E. Maclean.

The President was elected Treasurer, and gave notice of the proposed Field-days.

W. Fergus, Esq., M.D. and E. J. Turner, Esq., were elected Honorary Members, and A. H. B. Reynardson, J. S. Woodhouse, E. C. Sewell, C. A. Sladen and E. L. Hesketh, Ordinary Members.

There were 100 persons present—2 Hon. Members, 20 Members, and 78 Visitors.

MEETING HELD MARCH 3RD 1868.

This was a special meeting, called to consider means for securing more order at the general meetings of the Society.

It was agreed that members should admit only two visitors each, instead of three, as heretofore; and should take their places in the Museum before the entrance of visitors, for whom they should retain places.

E. Almack was elected Librarian, *vice* E. im Thurn, resigned.

MEETING HELD MARCH 6TH, 1868.

The following donations were announced, and thanks ordered to be given to the Donors:—

A collection of about 1500 British plants, by Rev. H. Baber.

A pair of Quails (*Coturnix vulgaris*), by E. im Thurn.

A Heron (*Ardea Cinerea*) by M. H. Smith.

A Stone Celt, a bronze vessel for the ashes of the heart, a glass lacrymal, and bone implement, by J. W. Parrington.

A head of the Gavial (*Gavialis Gangeticus*), by Mr. Parker, Marlborough.

A Tusk of a young Elephant, by B. W. Repton.

Wattle Gum, Tail of Tasmanian Opossum, and Leg of Astracan Sheep, by E. C. Sewell.

The following works: "British Ferns" by Miss Plues, "British Beetles" by E. C. Rye, "British Moths" by H. T. Stainton, F.R.S., and "British Bees" by W. E. Schuckard, presented by A. C. Almack, W. W. Dayman, and J. W. Mills.

Lists of Botanical and Entomological notices, taken during the past fortnight, were handed round.

EXHIBITIONS.

Ornithology.—Humming-bird, by E. im Thurn.

Archæology.—Samian ware from the Picts' Wall in Cumberland by G. G. Monck.

Bronze Spear and Axe heads and pin, from Ireland, by T. E. Maclean.

Geology.—Series of Scotch Pebbles, by E. Almack.

G. H DAWSON then read the following paper on

THE SALMON.

TO MAKE my subject as intelligible as possible and to avoid confusion as far as may be, it will perhaps be better to divide it under at least two separate heads. I shall endeavour therefore to give some account, (1) of the Natural History

of the Salmon, *i.e.*, to describe the different stages through which the fish passes, with some of its habits, (2) to mention some of the enemies to which it is exposed, and the dangers and difficulties to which it is peculiarly liable.

First, then, I would have you observe that it is one of the very few migratory fish, or, in other words, of those which pass part of their time in fresh and part in salt water without suffering any inconvenience from the change. Numerous species of the genus are found in our Northern seas, but I shall confine my remarks to the common Salmon.

The difference between the male and female fish as they appear in fresh water at the spawning time is considerable, the most noticeable point is an elongation in the lower jaw of the male fish, which turns upwards and forms a sort of hook, of the use of which I shall speak hereafter, it is quite hard to the touch and closely resembles a piece of bone; the male also becomes marked on the cheek with orange coloured stripes, and its whole body is much brighter than that of the female. The latter is dark in colour and in this state is commonly called a black fish. This perhaps is rather anticipating my subject, and I ought first to describe the transit of the fish from salt to fresh water. The cause of this migration, I need hardly say, is the depositing of spawn: this being placed in the more shallow parts of the river the young fish have time to gain strength before they move downwards towards the sea.

The time of year at which the fish leave the salt water for the purpose of spawning varies so greatly in different rivers that it is impossible to mention any definite time at which it takes place, as a general rule. My information on the subject is chiefly derived from what I have myself seen and heard to be the case in a Devonshire stream of no great size, but which is very well stocked with salmon. In different latitudes the season varies very considerably, and in some streams the fish are several months earlier or later than in others.

I must begin by telling you that in most rivers there is a weir, that is, an embankment of large stones, just where the salt water at high tide meets the fresh. This naturally is a great impediment to the fish in making their way upwards, for though the law enacts that some sort of pass be left open for them, it is not generally a very large one, and unless a heavy flood of fresh water comes down the river many of the fish are unable to pass the weir as they might otherwise do. This fact I mention as perhaps it may be the cause of delaying many fish for some time. Just below these weirs there is almost always a salmon fishery, where regular nets are kept for the purpose, and throughout a great part of the year the fishing is allowed, the close months as they are called, when there is no fishing, being from September 1st to February 1st, except that fishing with a rod and line is allowed between September 1st and November 1st. In the river of which I am speaking they begin to take fish in some numbers in these nets about the middle of June, which shows that

they are then beginning to draw near the fresh water. The numbers increase during the following month, but it is not until November that a great number of fish begin to ascend the river. From that time until March a practised eye will see many of them in the pools and shallows. The floods in the latter part of Autumn no doubt assist them greatly in passing the obstacle in their way.

It is, then, from November till March that the important work of spawning is done. The great object of the fish on first getting into the fresh water is to ascend to the highest possible point, for the sandy shallows are the spots best adapted for laying spawn. They will overcome wonderful impediments with this object in view, and, taking advantage of each flood or rising of the water, make their way upwards with marvellous energy. As the water subsides they are obliged frequently to drop back into the deeper pools, but only to renew the attempt with the first opportunity. The principal obstacles in their way are weirs and mill dams, but they have a wonderful power of jumping, and have been frequently seen to throw themselves a great height from the water, clearing an elevation of 8 or 10 feet and so gaining the water above.

The fish having ascended the river as far as they please or can, begin to make preparations for depositing their spawn. For this purpose they first proceed to dig out a pit in the sand, generally in comparatively shallow water and where the stream is rather swift. It appears that a male and female fish work together, and the excavation which they make is quite large enough to be very plainly seen from the river bank if pointed out by a person who has been accustomed to watch the habits of salmon, otherwise it might easily escape the notice of a chance passer by. The manner in which they first make the furrow is by working up the gravel with their noses, rather against the stream for they cannot work with their heads down stream, as the water, going into their gills the wrong way, would in a manner drown them. I have noticed the fish when engaged about one of these pits repeatedly turning over on their sides, and showing the white under parts I cannot say whether they may then be actually shedding their spawn or whether this operation may assist in throwing up the gravel. It is doubtless in a great measure done by the noses of the fish, and in this kind of work the under jaw of the male fish, which I mentioned above, must be of service. The pit being made, the fish proceeds to shed its spawn into it, to complete which operation takes from 8 to 10 days, at the end of which time it covers the spawn with the gravel previously thrown up. After this the fish betake themselves to the pools to recruit their strength. The adult fish having spawned, and being out of condition and unfit for food, are called unclean fish; the male when in fresh water, among other names is sometimes called a *kipper*.

With the floods of the end of winter and commencement of spring they descend the river from pool to pool, and ultimately reach the sea, where they

quickly regain their condition to ascend again in autumn for the same purpose as before; but always remaining for a time in the brackish water, before making either decided change, obtaining, it is said, a release from certain parasitic animals, either external or internal, by each change, those of the salt water being destroyed by contact with the fresh, and vice versa. It is moreover probable that the constitution of the fish, is such as to require a gradual change: that the salmon is considerably affected by passing from the salt water to the fresh is evident from the change of colour which accompanies the difference of the state of the element.

Having said so much and, I hope, given you some idea of the habits of the adult fish, I will try to tell you something of the young fry, the result of the spawn deposited in the manner described above. How long it takes for the ova to become young fish I cannot exactly say, but the young fish remains for a considerable time, for many days, either clinging to or covered by the sands of the spawning bed. On its first exclusion from the egg it has a very singular appearance. The head, as in the case of the tadpole, is large in proportion to the body, which is exceedingly small, about five eights of an inch in length and of a pale blue colour. The most singular part of the fish is a conical bag-like appendage which adheres to the abdomen: this bag is about two eighths of an inch in length, of a beautiful transparent red, much resembling a light red currant—in consequence of its colour it may be seen at the bottom of the water when the fish can hardly be observed. This bag appears to contain a supply of nourishment for the fish when in its earliest stages. At the end of about 50 days it contracts and disappears, and the fish then becomes perfectly developed.

At this stage it is commonly called the Parr. There have been great disputes as to whether this is really the young of the salmon or an entirely different species of fish, but from experiments which have been made it seems to be certain that it is the Salmon Fry. The chief reason for doubting this is the colour of the fish, which is of a blueish tint, without the silver of the salmon, whilst the fish is particularly characterised by transverse bars, something like finger marks on each of its sides. The young salmon, as might be supposed, would be of a silvery colour, but this it seems is not the case until it reaches the age of one and a half or two years.

Through the latter part of the spring and the summer the Devonshire rivers abound in a wonderful degree with these Parr, which take a fly at times with such readiness or even greediness that they are a perfect nuisance when fishing for trout. In most rivers you are ordered to return them to the water, otherwise at times, especially on bright and hot days, a fishing basket of moderate size might be filled with them, and though very small they are remarkably sweet and good to eat. They vary a little in size, but generally

are about from 4 to 6 inches long, and hardly any one of them weighs more than two ounces. These, it seems, are the fish in their first and second years; near the conclusion of the second year the fish assumes with great rapidity the characteristics of the salmon, the transverse bars disappear, and silvery scales take their place.

It is a very common error to suppose that salmon fry attain a length of six inches in as many weeks and after the lapse of this brief period take their departure to the sea. It is the rapidity with which the two-year old Parr assumes the aspect of the salmon fry which has led to this mistaken conclusion; for hasty observers, noticing (1) the hatching of the ova in the early part of the year, (2) the seaward migration of young salmon at a season of the year very shortly afterwards, have imagined these two facts to take place in immediate or speedy succession, whereas in reality the young fish which are migrating sea-wards have been two years or nearly that time in fresh water.

Many experiments by careful observers seem to establish these as certain facts. In one case several specimens of the Parr were caught in the month of July and placed in a pond supplied by a stream of fresh water; where they continued to thrive remarkably well. In the month of April following they began to assume a different aspect from that which they exhibited when first placed in the pond, and catching some of them in May they were found to have assumed the usual appearance of what are generally called salmon smolts or fry, being of a fine deep blue on the back with a delicate silvery appearance on the sides of the body. A circumstance occurred in May worthy of notice as illustrating the migratory instinct of these fish: they seemed at that time to be decreasing in numbers, and on examination it was found that some of them had leapt altogether out of the pond and were lying dead at a short distance from the edge. From this it is evident that the fish at about this period in their existence, *i.e.*, in their second year, perhaps nearly at its conclusion, would in the natural order of things be making for the sea.

I should perhaps here say a word of the *salmon peel* as it is called, which is a fish varying from ¼lb. to 3 lb. They come into the rivers about the end of July when they may be caught with the artificial fly or minnow. It is a disputed point whether they are the young salmon in a certain stage of growth, or fish of a different species but of the same genus. In this authorities differ, and I cannot say what may be the truth. One person whom I myself consulted on the subject and who has observed the habits of salmon a good deal is inclined to the latter view of the case, that is, that they are not of the same species as the common salmon.

This is, I fear, but an imperfect account of the salmon and its habits, but having said so much I will now pass on to the second part of my subject,

and say something of the difficulties and dangers to which the fish is exposed You will always observe that any creature which is unusually productive has a great number of enemies to contend against, and the salmon is no exception to this rule; though in its case the destruction is greater than it need be, and a little care and good management might greatly lessen it. Whilst speaking of the great productiveness of the fish it may be well to mention that a yard square of suitable gravel is sufficient to hatch 20,000 salmon ova.

If therefore all the fish, which try to ascend our rivers, were allowed to do so and to reach the spawning beds, which may generally be estimated by acres, the number of fish produced in a single year would be something prodigious, and if these numbers increased to a large extent, an abundant supply of nutritious food might be procured by all classes and at a moderate price—it is very plain that salmon *need* not be such an expensive luxury as it is at present. Taking this into consideration it seems worth while to consider briefly what are the chief causes of the present destruction of the fish—of these there are two which may especially be noticed—*first*, the fish are not allowed to ascend the rivers as far as they would naturally do, and so are obliged to deposit their spawn on unfavourable ground—*second*, too many fish are killed, that is, there are not enough left to stock the rivers.

As regards the first difficulty, I have already mentioned the obstacles which are caused by the weirs of which there are so many in most rivers, but it may be well to speak of these rather more at length. We will suppose, then, the fish to have reached the first weir in the river, just where the fresh water meets the salt, and for argument's sake we will suppose that he does so in one of the months when salmon fishing is allowed, for many fish are unquestionably trying to get into the rivers before the late autumn or beginning of winter when fishing is forbidden by the law. There is probably but little fresh water coming down and the obstacle at first appears impassable: at last after trying it at many points the fish comes to the entrance of the salmon pass, a narrow passage, that is, or a sort of trough of water passing through the stones of the weir. Here there is sufficient space for a fish to pass upwards, but it does not look inviting, and it is a great chance if he ventures upon it, for many hours at least; and before he makes the attempt the net of the fisherman who lives close to the weir encircles him and his companions who have gathered towards the one spot with the same object in view. By these means a very large majority of the fish are taken in the season. There is indeed a certain time in each week when the nets cannot be used, from 12 o'clock noon on Saturday, to 6 a.m. the next Monday morning, but it is improbable that many fish make their way through the pass in this short interval. Supposing any should do so, it is only to meet with a similar obstacle a little higher up, for at the next weir there is probably a net similar to the one below, or perhaps no

fish pass at all; and so on all the way up. It is therefore almost a miracle if any fish do manage to reach the shallows in a river, which are the regular spawning grounds, at this season of the year: and this fact probably accounts for the great scarcity of salmon in many of our rivers during the summer months, whilst they are found there in considerable numbers in the winter.

Now let us consider the case of a fish which has to make his migration in the autumn or winter, and we shall see he is not much better off. There *may* be a flood of fresh water, and he may therefore find less difficulty in surmounting the weir. Otherwise there is the same difficulty about the fish pass, and this is said to effectually prevent some fish from getting into the rivers at all. There are no nets now to stop him for they are forbidden by the law, but there are poachers who care nothing for the law or for the fact that 9 out of 10 of the fish are not fit for eating. I am now speaking particularly of what I have myself seen, and I believe that on the river in question, there are many men who during the winter months almost make a livelihood by salmon poaching. At that season the fish are very abundant, and are easily taken, the men like the sport and are able to make something by selling the fish to farmers, who, as a class, encourage this sort of thing. Two keepers only are kept to look after some 12 miles of water, and so good a watch is kept upon them that they are easily eluded. Moreover supposing a man is caught in the act of taking a fish, the penalty, which is not large for the first offence, probably does not fall upon him personally, for he is in all probability a member of some poaching club; so that the individual has not much of the fine to pay. All this shows how easy it may be for persons to destroy fish in an illegal manner, and you may form some idea of the numbers which are killed when I tell you that I have heard of a man having boasted of having taken out, as they call it, 100 fish in one winter. The price which a farmer will give is from 4d. to 8d. a pound according to the condition of the fish, and in some instances even the farmers' sons try their hands at the business. The general way of taking the fish is by the use of the spear or gaff, and if the fish is anywhere within reach it is not very difficult to kill him as he will not take much notice of pokes, &c., and will remain in the same place for a long time together. The spear which is used is a murderous sort of weapon, having four points with two barbs. It is more generally used than the gaff, though the use of the latter is, I believe the more artistic way of taking fish. Such is the chief danger to which the fish is exposed in the winter months; but there are others, as for instance mill wheels, which destroy numbers of salmon. As they are returning down the river they are very liable to run into a mill leat, and are thus washed under the wheel when their destruction is inevitable. In January, 1867, I saw a large male fish picked up close to the bank of the

river, which weighed 22lb. without its head, and had evidently been killed in this way as there were many bruises across his back. Millers will tell you that they pick up many thus killed. Again I have seen a fish partially eaten by an otter, and some few no doubt are killed in this way.

The poachers and these other enemies and difficulties explain in part what I meant by saying that there are not enough fish left to stock the rivers. But besides this, the legal fishing is carried on in a manner which is, to say the least for it, highly injudicious. As I have said, almost all the fish in the summer months are caught before they have a chance of entering the river at all, and thus perhaps the strongest and healthiest of all are prevented from breeding. The owner of the lower fishery says "If I don't have them my neighbour above will and I have as much right to them as he has," and the same thing is repeated by the owner next above and so on. Thus the real danger to the fish is caused by its migratory habits; they are not like fixed property and every body takes his share when he can get it. The mistake of the present system of fishery is that the landowners and others who have the right of fishing have no mutual reliance, no community of action in preserving the stock. If it were otherwise all would benefit by it, and the number of fish might be greatly increased. A writer in Fraser's Magazine who has written an article on "Prospects of the Salmon Fisheries" makes some remark of this kind and as a remedy suggests that all the Landowners and others claiming the right of fishing on the rivers should form an association and establish fisheries at certain points only on the stream; so that too many fish might not be destroyed, and the fishing might thus be conducted in a judicious and systematic manner. Each landowner might thus have his share of the proceeds according to a value set upon the water on which he has the right of fishing, and the wholesale destruction of fish at the lower parts of the river might be stopped. Questions of this kind are now being constantly debated, and you can hardly open "The Field" and some other papers without finding some article on Salmon and Salmon Fisheries. It is to be hoped therefore that something will be done for the better preservation of the fish in every way, in which case their increase would manifestly be very rapid. Without saying anything against the present Act on the preservation of Salmon, we may at least hope to see its enactments better carried out.

S. B. Dixon, Junr., Esq., and F. Storr, Esq., were elected Honorary Members; and S. Image and H S. Sankey Ordinary Members. E. B. Maitland resigned.

There were 114 persons present - 3 Honorary Members, 27 Members, and 84 visitors.

W. H. Macdonald, Esq., was elected an Honorary Member.

There were 125 persons present, 6 hon. members, 27 members, and 92 visitors.

MEETING HELD MARCH 20TH, 1868.

THE following donations were announced, and thanks ordered to be given to the Donors :—

Stainton's "Manual of British Moths," 2 vols, by the Rev. H. Bell.

Darwin's "Animals and Plants under Domestication," 2 vols., by Miss Corrie.

Bates' "Naturalist on the Amazons," by G. H Dawson.

A collection of Coins, by A. D. Nind.

The Heads of Sections gave their Reports.

EXHIBITIONS.

Geology.—Part of the Shin-bone of an Ox, from the drift in Berkshire, by E. Almack.

Entomology.—Caterpillar's Nest from a Fir-tree, near Leuk, in Switzerland, by the President.

Archæology.—Cockle Shells worn by pilgrims to the Holy Land, by the President.
Portion of a Shell fired into Pompeii by the French, in 1849, by E. Almack.

Botany.—Rice Plant and Sugar Cane from Egypt, by E. S. Preston.
Specimens showing the peculiar growth of *Wistaria Sinensis*, by H. M. Hilton.

Zoology.—Specimen of Venus' Flower Basket *(Euplectella speciosa)*, by E. im Thurn.

The Rev. J. SOWERBY then read the following Paper, illustrated by Maps and Photographs, on his

WALKING TOUR IN SWITZERLAND, IN 1864.

IF in the present paper reference is frequently made to things generally uninteresting, such as times and distances, and in particular the state of the weather, I must plead in excuse that on a pedestrian tour in Switzerland these things are of the utmost importance, and take precedence of everything else. The last question you ask before going to bed is "what kind of weather do you think it will be:" the first on waking "what kind of weather is it?"

I entered Switzerland by way of Bale and Lucerne, and on June 25th I took the mid-day boat to Fluelen. No amount of repetition can spoil the charm of that voyage. The only nuisance is the numerous touters, either landlords or agents of landlords, who pester you to take carriages to different points on the St. Gothard road. One man was most importunate and even rude, in answer to my frequent refusals, but when to satisfy him I explained that I was going to Unterschächen, he became quite civil. We had some conversation together, in which he regretted much that the country was not

flatter, a wish in which I need hardly say I did not agree, and finally he was kind enough to volunteer to send my old guide Ambrose Zgräggen from Silenen to join me. At Fluelen I got into marching order. The road to Altdorf was very dusty and the sun oppressively hot; so as soon as I turned down a shady lane leading westwards into the Schächen Thal, I took off my coat and waistcoat and strapped them on to my knapsack. After passing Bürglen, Tell's birthplace, a village picturesquely situated among trees, the road began to ascend, and in a few minutes I could see into the Schächen Thal, whose scenery here is nothing particular: The sight of some butterflies reminded me of my recently developed entomological tastes, in proof of which I had a net and a collecting box, which were soon made ready, and a stick cut from the nearest copse. Very soon I came on a perfect cloud of large blues, something like Chalkhill, whilst on the other side of the road were a number of Black-veined Whites hovering above some running water. After capturing some dozen, I went forward again, the weather now becoming overcast and some rain beginning to fall. Presently over the wall on one side I saw several other butterflies. They were only Marbled Whites, but in my ignorance I thought they were Bath whites, and was over the wall in a moment after what I thought a great prize. The first stroke I missed him, but thrust my alpenstock right through my waterproof. With more care and deliberation I succeeded in securing three of them. I passed Spiringen where a path turns off to the Kinzig Kulm, by which Suwarrow's army passed in 1799, and in another hour reached Unterschächen, a long straggling village, extending some $\frac{3}{4}$ of a mile. From an eminence at the entrance of the village I had the first fine view of the head of the valley backed by the Clariden Alps. I went right through the village without discovering the Inn, and was then disgusted to learn it was at the other end. No wonder I missed it. I don't think the sign was six inches square and it was more like a weathercock nailed on the wrong way, than anything else. The house looked by no means inviting, but they had just built a new one over the way and had furnished some of the rooms without as yet occupying it. These at any rate had the advantage of perfect cleanliness. I was rather afraid that I should be starved, and was relieved to find they had some veal, and capital bread, butter, and beer: and on these I thought I could hold out very well till Monday, when I had no doubt of being able to make a pass I proposed into the Maderaner Thal and get to better quarters at Amsteg. Next morning I was suprised with the grand view from my window. The Brunni Thal which enters this valley here from the south, is closed at its head, by a magnificent circle of mountains, whose precipices are in some cases nearly $1\frac{1}{4}$ miles high. After breakfast I walked to the Klausen pass, about three hours off, but had no view as the weather was hazy and gloomy. Returning about three in the afternoon I was glad to find Zgräggen. He was not acquainted with the pass I wished

to make but offered to take me by another more to the west. We made arrangements for starting next morning, but without much hope of doing so, for the long threatened rain had at last begun to come down steadily. All night it never ceased and next morning was falling as continuously. The clouds had descended and lay almost on the ground, so that nothing was visible but for a very few yards either way. The intervals between the welcome cases of meal-times were very hard to fill up. I read Murray (for I had been assured in London that his was the best guide, being a new edition) and the more I read him the more I maligned him, for I was continually falling in with something I knew to be wrong. I observed all I could see out of the window, sketched the parson's house opposite and himself as he passed from parsonage to church in his robes, and examined everything in the rooms till I knew them all by heart. The salle-a-manger was adorned with three engravings, one of Odessa, a second of Cronstadt, no doubt memorials of the Russian war. The third was a thoroughly German picture, called the tree of love; in whose branches are represented twelve gentlemen of different ages and occupations, whom as many young ladies by various devices are endeavouring to capture. One has just applied a ladder and succeeded in leading off a gallant hussar, others have ropes and hooks; and two are endeavouring to saw the tree down and capture the whole at once. Beneath are some verses relating the story of this tree; the whole being a creation of Gretchen's sleeping fancy, who sighs on awaking to find that it was all a dream. My position was truly isolated: except at meals I was the only inhabitant: the only means by which I could summon the waiter, or landlord rather, was by a series of shouts or by going for him. Zgraggen now and then paid me a visit of condolence on the state of the weather, but with these exceptions I saw nobody. The weather improved a little at night, and I went to bed at eight hoping to be roused at four with the news of a fine morning. But in the morning the fog and rain were both very bad, so I took it out in sleep and did not get up till eight. At about five however my curiosity was roused by a noise, repeated sometimes at longer, sometimes at shorter intervals, which exactly resembled the sound of a bat against a ball. I hardly thought the Schächenthalers would play cricket, or if they did, not at so early an hour, and at last I was curious enough to get up and see what it was, and took some shame to myself when I found it was the sound of the swinging wicket as the people passed through to early mass. As the morning advanced the clouds began gradually to rise, and it was soon evident that a great quantity of snow had fallen in the upper regions; the pines a few hundred feet up the slope were all hanging white. At noon it was so much better that we ventured on a walk up the Brunni Thal to the base of the great precipice. The fog still hung low and snow-showers fell occasionally, but the breaks in the clouds shewed patches of blue sky. The

rumble of dust avalanches was heard almost incessantly, we saw many of them descending the rocky face just like waterfalls. These seldom fall except during the winter or immediately after a fresh fall when the snow is dry and powdery and has undergone no pressure. The surface snow only slides off, which is unable to rest on the slope, and is disturbed by the wind or some other cause. We returned to the hotel with better hope for the morrow. Had I not had this to sustain me I think I must have been driven to translate Gretchen's dream or to compose an ode on the weatherbound stranger, and in either case I am sure English poetry has suffered a loss.

Next morning the weather was all we could wish. Just before starting Zgråggen informed me that the curé had been summoned to visit a sick person on the Sittliser Alp. This lay on a high plateau some 2000 feet above the village, reached by a path through the Brunnithal, and inhabited in the summer by a considerable part of the population. Rather a serious undertaking, to climb for some two hours through deep snow to visit a parishioner, and a rare summons too, for generally the younger members of the family go up to live on the Alp, and the fine air tends to keep them in health. The injuries to which they are liable are rather those of accident than of disease: the falling rock, the avalanche, the false step that betrays them over the cliff or into the roaring torrent number more victims here than the fevers we so much dread. You cannot walk far without seeing some token of such a fate: a cross, a rude image or painting of the Virgin marks the spot. Here they are nameless, but in the Tyrol an account of the accident is added and often a rude representation of it, not always without merit. Last summer in descending the Oetzthal we counted not less than 70 of these memorials. We got away at 5-40. We followed our walk of yesterday up the Brunnithal, and then struck off to the right up through a pine forest. We soon came to the fresh snow and made all the preparations we could against it, for it was both soft and sloppy. We soon got out of the pine wood into a valley running parallel to the Schachenthal, by name Griesthal. The snow became gradually deeper till it was often over our knees, and after we left the shelter of the wood, the glare of the sun upon the snow was almost insupportable. I had both veil and spectacles; but Zgråggen not anticipating a snow pass had come unprovided, so I lent him the veil and put on the spectacles myself. The ground was rough, covered apparently with stones and patches of alpine rose bushes, whose tops here and there were sticking up above the level sweeps of snow. Zgråggen never knew whether he was going in a foot or a yard, and met with many a mishap in spite of sounding. Of course I profited by his stumbles, but with all my care I could not escape some falls, though the depth of snow saved me from any damage. About 9-30 we reached an empty chalet, rather wearied with our long wading and were glad to use it for our first refreshment

as the snow made it impossible to sit down outside. Here we had an opportunity of looking round at more leisure. In front the valley in which we were still continued rising slowly, its beds and sides both covered with snow. Behind we saw in line one after another the Great Windgelle, the Great Ruchi, and Scheerhorn, a magnificent array of rocky peaks. Between the second and third of these lay the pass I wished at first to make; the long snow hollow leading up to it was right opposite to us. Close to us was a singular little peak, very steep and rocky, called Schwarz-stückli, which the late fall of snow had converted into a little Matterhorn. We started again before 10, and after going about half a mile up the valley began to climb the ridge on our left. As this was steeper, our progress was slow and it was eleven before we reached its crest. The wind had swept the snow clear from some parts of this, and we were enabled to sit down comfortably, though the thermometer was only 38°. An observation with an aneroid gave the height about 7,400 feet. The view from so low a point was very singular, it resembled more what you see on a pass of 10 or 11,000 feet; nothing but snow and rock was visible, except that in the distance we could see some pinewood on the slopes leading to the Kingy Kulm. Below us on the other side was a small lake, the Seweli See, surrounded by some patches of flat land, which ought now to have been occupied by the grazing cattle These had all been driven to lower regions at the approach of the storm. Descending the steep slope we passed the lake just at its outlet, and began to pass at a level along a slope of grass between two ranges of precipices. This slope had evidently been covered with snow which had slid off again, for the grass was all straightened out downwards, as if it had been hard raked. Presently we came to a patch of snow, about an acre in extent, which had evidently fallen from above, as it was not smooth, but quite lumpy, and covered with irregular masses, sometimes several feet higher than the rest. A part of this on the lower side furthest from us had apparently just slid off. I did not like the look of it at all, and proposed to go close up under the upper rocks. Zgråggen, however, objected to this on the score of possible avalanches from above, so we started to cross it at the narrowest part which might be 30 or 40 yards wide. The walking was troublesome, for it was very uneven and sometimes you could hardly get your legs over the lumps. We had nearly got over, when a shout from the guide attracted my attention, and I saw that the portion beyond, under which we must pass, was slowly moving downwards with a hissing noise. Somehow or other we were off the snow in a moment and running for our lives under the moving mass, which we then beheld rush over the cliff below with a thundering roar. It would have seemed safer to cross the patch higher up, where it was broader, as there would have been more resistance to any tendency to move. Had we done so, I really think we should have been too much entangled in it to escape.

We were soon clear of the slope and well round the shoulder of the Little Windgelle, whose pinnacles stood out finely above us. A rapid descent down some steep and slippery grass slopes brought us to a path, which though rough made the walking easier. We got down into the valley at 3.30, having descended nearly 6000 feet; another quarter of an hour brought us to Amsteg, where the White Cross received me more like a friend's house than an Inn. Here I found a letter for me from Mr. Preston, giving some information which I hoped would enable me to know some of the butterflies I might catch. I meant to take my ease the next day and to start by a glacier pass for Engelberg on the Friday. Next morning I went over the Reuss to a flat piece of ground covered with low shrubs, which is overflowed when the river is in flood. Here I caught some Apollos (magnificent butterflies they are, with their orange and crimson rings) and some more imaginary Bath whites: but the sun would not stay out, so in the afternoon I took a short walk up the Maderaner Thal, ascending by Frenschberg and returning by Bristen. In the evening, rain again set in, and continued till the middle of the day, when it cleared, and I went with Zgräggen again up the valley. After passing Bristen we turned to the left and climbed up to the village of Golzern (nearly 3000 feet above Amsteg) and its pretty lake, encircled by pines and famous for its excellent trout: passing this we descended again into the head of the Maderaner Thal by a steep and in some places difficult path, which crossed the faces of several precipices with very indifferent hold for feet or hands. And yet habit renders even these easy to the natives; I saw both men and women traversing this and some with heavy loads. On an eminence commanding a fine view down the valley, and which probably is one of the very few situations quite safe from avalanches, we found the workmen busily employed in preparing the foundation of a new Hotel, contemplated by the enterprising landlord of the White Cross, Major Indergand. He was here in person and invited us to have some coffee. I asked some questions about Gideon Trösch, an old guide of this neighbourhood, of whom I read a strange story in Tschudi's "Animal Life in the Alps," that once in his youth he had had a terrible struggle with a vulture. He had shot the creature and thrown it over his shoulders to bear home. Recovering, it attacked him with great fury, until he was at last able to fell it and (as he thought) kill it by a blow of his gun. But strange to tell, the very same thing occurred again. The vulture again recovered, and again attacked him, and it was only by desperate efforts he at last came off victorious. They said he was still alive and boasted of this exploit, and further, that though now old and unable to climb much, he thought no one knew half so much about the hills as himself. On the way down we saw the curé of Bristen at his fishpond. It is well stocked with Golzern trout and fenced off by a strong wall from the foaming Kerstclen Bach, whose rush makes the bridge quiver. We did not get

to Amsteg till 7, and after giving the necessary orders I went off to bed, as I was to be called at 1 and to have a vehicle as far as Klus, a village opposite the entrance into the Erstfeld Thal.

I awoke next morning with the consciousness that I had been called, and lighting a candle found that it was twenty minutes past one: so dressed hastily and on going down found breakfast ready. We got away soon after two, and in half an hour were at Klus. Here some time was lost in looking for a rope, and we did not get fairly under way till 3.15. It was a dull morning with just twilight enough, for us to avoid obstacles. A steep ascent of 20 minutes brought us into the entrance of the Erstfeld Thal, and the walking then became easier. The valley runs nearly due West and its bed for a long way rises gradually; on one side or the other were occasionally spots capable of cultivation. In about two hours we reached a gorge, through which the stream rushes in a series of fine cascades. The path here was close to the water and we sometimes had to go over rows of pine logs fixed into the face of the rocks and slippery with the spray. At the head of this we halted for another breakfast by the side of a small rivulet. Twenty minutes soon passed and we left the gorge to find ourselves at the commencement of another level part. The day began to look better; the clouds began to clear off, and some fine rocky points were visible on both sides. In front rose the Schlossberg, a range of dark precipices surmounted by a snow peak, glittering in the sunshine. After passing some dirty chalets we came to a fine waterfall some 300 feet high, rushing over the cliffs on our left: supplied by two small tarns called the Ober and Unter Fulen See. The foot of the glacier was reached at 7.30 and as far as I could judge we had risen about 4000 feet from Erstfeld. We were in the centre of a vast amphitheatre of glaciers descending from the Kröntlet, Spannorter and Schlossberg. The first of these lay to our left, surmounting the most shattered portion of the icy circle: the second right in front, rising still more than 5000 feet above us. Between this and the Schlossberg on our right was a deep depression, over which we were to pass. From our point of view it seemed possible to ascend directly up the glacier, but Zgräggen said the recent snow fall had covered over everything and made the dangers invisible. He proposed to gain the slopes of névé under the cliffs of the Schlossberg and to follow their line to the summit. Between us and these slopes lay a lower line of cliffs, and we gradually advanced to the base of these, always crossing avalanche snow. I had never seen so great a quantity. Many acres were covered with it, dirty, sodden, and lumpy, and tossed up like the waves of the sea.

Crossing the rocks with some difficulty we halted for a few minutes on a piece of moraine, to put on rope and spectacles before entering on the névé; we here could see much of our Wednesday's walk: the snow had entirely dis-

appeared from it. In a few minutes after starting we found that we were going to have a harder task than we had bargained for. We ought to have been on the snow three hours before; already it was so soft that we sank over the ancles at every step. As we advanced, it soon became plain that enormous quantities of snow had come over the cliffs during the last day or two. Every ten minutes we had to cross the debris of avalanches, which had come from the Schlossberg, many of which extended hundreds of yards to our left far down into the amphitheatre, widening as they descended. These, though rougher to cross, afforded firmer footing than the smooth intervals between them, which every minute grew softer. A few light clouds occasionally passed slowly over the glacier about our level, and afforded a welcome shelter from the heat. We had just crossed the remains of an avalanche and were on the névé beyond, when a faint hardly perceptible murmur was heard from above. In these regions of solitude the slightest sound attracts attention. Again it came more distinct from the cliff overhead. Avalanche, said Zgraggen, and as I hurriedly looked round to see where we had better go, he pointed out to me that we were on *smooth* snow, and that the avalanche would only descend by its wonted channel. Whilst these few words were exchanged the murmur became a deep rumble, the rumble a rattling roar and with wonder, not unmixed with terror, I saw the mass of snow burst like a huge waterfall from the top of the cliff and fall with deep dull thuds upon the slope within little more than 50 yards of us. Almost at the same moment another flew over the cliffs just behind us. There were not merely masses falling over, but long streams forming a continuous fall for nearly a minute. It was a magnificent spectacle; but some of those whose remains we had crossed must have continued falling for many minutes, possibly for hours, when the Schlossberg began to shake off the mantle of snow which summer had unexpectedly given him.

When silence once more reigned we went forward, ever slower and slower. The windings of the cliff for some time hid the top of the pass from our sight, and on turning a corner we seemed to be not more than half a mile off; but I thought that half-mile was never coming to an end. After going in knee-deep it became very wearisome, and at last we were reduced to halt every 50 yards or so, and by patiently repeating this operation, we at last gained the col at twelve o'clock, exactly eight hours and three-quarters after leaving Erstfeld. Here the oppressive heat was immediately exchanged for a sharp cutting wind. The aneroid observation gave the height 8720 feet, so that we had ascended more than 7000 feet from Erstfeld. The view was of course very limited as the cliffs on each side came within 100 yards of each other. The finest part was the expanse of glacier below, on the border of which we had come up; it was too cold to rest here so we soon started on the descent. The snow was

too soft either for glissading or sliding, but by sitting on our alpenstocks laid lengthways we got up a respectable pace and in 15 minutes got off the névé on some rocks, where we stayed basking in the sun for more than half an hour. I was so wearied with the long pull through the snow that I could hardly eat anything; and the acid Neuchatel seemed nauseous. What would I not have given for a glass of beer! Our downward course then led us rather N. still under the cliffs of the Schlossberg. We presently come to a long hollow filled with snow, which seemed to promise good going, and all was very comfortable till we found that stones from the top of the cliff fell into it—I saw several come from the top with a bound just as if they had been running down hill. We very quickly got to a respectable distance on the further side, and only approached when we were forced to cross it in order to get further round the Schlossberg to turn a line of cliffs below. We had in fact almost to make a complete circuit of this ill-disposed mountain, which on both sides seemed to resent our proximity. We reached the valley about 2.30 and soon joined the horse track from the Surenen Eck. About 20 minutes after reaching this, when we were on the N. side of the stream and several hundred feet above it, we heard a crash overhead, and looking up, saw a cloud of dust above the opposite cliff, some 2000 feet up, and perceived that a large mass of rock had broken away from the face and fallen into a rocky ravine below. Here it was out of sight but we could hear it grinding furiously through and see the puffs of smoke shooting out from the force of the collisions. Presently the rock or rather its fragments, (for it had now broken into three pieces) emerged from the gorge: and these at almost every bound parted into more, so that in less time than I take to read it, the opposite slope was covered with blocks of all sizes running and jumping furiously down, with a confused sound of rumbling and crashing as they jostled one another. The cattle fled in all directions and Zgräggen declared that he saw one of them struck. I thought our position one of perfect security, but some of the blocks bounded across the stream and came far up on our side. When the confusion was over, the lowings of the terrified cattle were heard, whilst still up above a cloud of dust hung over the cliff like a funeral pall. No doubt we owed this unusual spectacle as well as the sight of the avalanches to the late heavy fall of snow and its rapid thaw. Such falls are like the avalanches, most common in the spring. When on a large scale, they are far more destructive than these to property and life, as all they cover is hopelessly ruined: and instances are on record where hundreds and even thousands of lives have been sacrificed.

After passing Herren Ruti, the farm of the Abbey of Engelberg, the valley began to open out, having more than a mile in width of level land, and 5 or 6 miles in length; here were large fields regularly laid out and cultivated. Almost all the valley belongs to the abbey, whose monks carry on a large trade

in cheese and cattle. We reached Engelberg about four and put up at the hotel Catani. As soon as possible, I had some soup and a glass of beer, which refreshed me greatly and I felt all right again. Next morning I went up to a pleasant spot in the woods above the village and sat there long, enjoying the lovely scenery. The wide fertile valley with the back-ground of dark mountains, surmounted by snow peaks, made me think this a most desirable place to spend a week. Excursions of all kinds, light or heavy at pleasure, combined with the prospect of fair, if not good, accommodation at the end would be a great attraction. We intended to cross a pass called the Grassen on Monday; but I feared the soft snow of which we had such a dose yesterday, and hesitated what to do. In front of me above the opposite woods rose the Pfaffenwand (or Priest's Wall) with its sharp zigzags leading up to the Joch Pass to Meyringen. The sight of it recalled to my mind an old promise of three years standing, to go and climb the Ritzlihorn with the curé of Im Hof with whose family we had become acquainted in 1861. So I joined the early table-d'hote, where not less than 90 or 100 sat down, and had a very good though rather greasy dinner: the beer however was first-rate. After this we packed up our traps and got away at 2·30. As we neared the Pfaffenwand, rain began to fall, though not heavily—at the top of it we met with a French school, travelling as is their wont with a tutor, and with the smallest amount of impedimenta I ever saw. One porter always seems enough to carry the baggage of the 12 or 15 who compose the party. Just after passing them the storm began to come down in earnest,with thunder and heavy showers of hail. The kindness of the Amsteg people had provided us with umbrellas, which were a great protection against the driving hail. The storm lasted all the way to the top of the Pass, which we reached at 5·30. After halting a few minutes at Engstlen to refresh we hurried down to Im Hof, where we arrived at 9: exactly six hours and a-half from Engelberg. Next morning I called on the curé and found only his wife and mother-in-law at home. He was at a business meeting held in the hotel. I tried to persuade them all to come and dine with me, but only could get himself to come. He had not yet made the ascent and was quite willing to go, but after consulting several of his parishioners, he said there was still too much snow. This as it turned out was a great mistake, there being hardly a single snow-bed on the west side; but concluding that they must know best, I promised to come again in a fortnight and have a try with him. Not to lose time, we started after dinner and walked up to Stein at the foot of the Susten Pass, where we passed the night at a little inn more than 6,000 feet above the sea. Next morning over the Pass to Wasen and up the St. Gothard road to Andermatt; this was one of the finest days we had, and I regretted much we had not tried the Sustenhorn, but the guides asked rather a high price. At 4 on Wednesday we left

Andermatt and followed the road to the Oberalp Pass for about an hour, then turning to the left we gained a col between the Rienger Stock and the Bergli Stock, about 8,000 feet high, leading into the Felli Thal, not having had more than an hour on snow. This valley we traversed in its whole length. It was rather monotonous on account of its straightness, though we had some fine views of the Bristenstock and Mutsch on the right. We stopped some time at a chalet, where Zgräggen found acquaintances. I waited outside and was amused by observing the sagacity of the pigs of the country ; there were three of them lying in a little hollow in a bank into which the sun shone with full strength, the inside one looking and no doubt feeling excessively comfortable; another appears on the scene and after surveying the situation with the eye of a general, steps in and lays himself down on the back of the inside one, keeping well next the bank. The oppressed pig struggled, but the more he moved the deeper the new comer sank in, until at last the other got up and went away with some indignant grunts which probably meant that he would come back presently and serve him the same. A steep descent through pinewoods brought us to the valley of the Reuss. On this descent I caught a moth, very like a Greenveined white, &c., and a Fritillary something like a Duke of Burgundy, with a very purple underside to the hindwing, perhaps Melitaea Dia. Once into the valley it was excessively hot and butterflies were very plentiful. The slopes in some of the hayfields were covered with Apollos. I got a number of them and also some fine specimens of the common Swallow-tail. The scarce one I never saw except in the most southern parts of Switzerland. I find surprise expressed in my note-book at having as yet caught no Great Fritillary; of course it was hardly time for them. We reached Amsteg at 1 p.m., after a charming walk, the more pleasant that no one had anything to carry, having sent our traps to Amsteg by the diligence.

Next day I hoped to have a fine hunt, but as usual in those cases, the sun never came out at all. I walked up the old road which follows the east side of the valley as far as the bridge (Felli brucke) where the Fellithal joins the main valley; and on the way I caught a couple of butterflies very like large Walls. This part of the road must have been fearfully exposed to avalanches. It crosses two hollows in the face of the Bristenstock, one cut deeper into the mountain than the other. The former was close to Amsteg and I have seen snow in it 12 feet thick lying close to the bed of the Reuss as late as the month of July. This year the second ravine was choked with the remains of avalanches. The stream had bored its way through, and from the lower end you could see through the tunnel, which was 60 or 80 yards long and high enough to admit of going through upright, though I did not care to venture. Close by was a cross marked 1861. In the spring of that year a father and two sons who lived near, were crossing on their way to some work. The sound

of the coming avalanche was heard and all hurried across to gain a place of shelter, but only the father reached it. So firm and deep was the mass of snow that the bodies were only recovered three months after from their icy tomb.

On the 8th of July we started at 5.30 for a walk among the hills west of Amsteg. Having no definite object, we went very slow and stopped frequently. Here I perpetrated the only piece of bird's-nesting I recollect. Seeing a bird fly out from under a rock, I felt and found a nest containing three eggs, one of which I took from curiosity and brought home with me. It was very like the shore lark's egg, of a deep mottled grey colour. In about 4½ hours we were on the ridge overlooking Amsteg. Behind us was a rocky double pointed summit, which would evidently command a better view. So we felt our way towards it, becoming gradually conscious that to go to it along the ridge was the worst possible way. The rocks were several times very troublesome. Sometimes we must go over, sometimes creep under them—now finding advance impossible and retreat almost as difficult. A boy who was looking after some cattle assisted us a little and once nearly led us into a place between two rocks from which I am certain I could not have got without help. We had no rope, or a great deal of trouble would have been saved. Got up at last about 12.30. We were about 8,000 feet high, and had a fine, though limited view, except towards the N. and N.E. I made a list of the principal objects visible, amongst which were the lakes of Lucerne, Zug and Zurich. We left the summit by a different and much easier route, and got down to Amsteg in 3½ hours. At one time I had the net out, and a man observing my occupation told me he had something very wonderful, which he ran off to fetch. It was a large moth very badly set, for which he asked three francs. I declined to purchase, but took a hasty sketch of it, from which I afterwards found it was a Death's-head.

July 9th, I went with with Zgräggen and Joseph Maria Trösch over the Kreugli Pass to Sedrun, to ascend the Oberalpstock. We were 8 hours in getting over but we sauntered very much. On the way we paid a visit to Trösch's summer house in the Etzlithal, where he lives with his wife and two children in a comfortable but very dirty state. He has some rights of grazing up there, and about 25 goats, which constitute him a man of some mark in his own neighbourhood. From the top of the pass (7717 ft.) we had a full view of the Oberalpstock, and discussed the mode of attack, which was obviously much easier than the way followed by Hoffman in 1847: but I think the great quantity of snow this year was very helpful to us.

We left Sedrun next morning at 4 o'clock. There was a thick fog, with a heavy dew, which made us hope the weather would be all right. For more than an hour our way lay up the Strim Thal which we descended yesterday. To my surprise we met a whole family coming down. They had left the Etzli

Thal the previous evening and crossed the pass at midnight to attend the festival of St. Blasius at Dissentis, which we had the pleasure of witnessing two years ago, and which is chiefly remarkable for a great expenditure of powder and a long procession of relics. They made some communication to my guides, which was quite unintelligible to me, till enlightened by subsequent events, about some one being in a great rage. As we approached the head of the valley the fog began to clear off, and we beheld with joy the glorious snow peaks glittering through the misty veil. At the foot of the Kreuzli Pass we struck off to the right up some grass slopes and from there gained a branch of the Strim glacier over some rocks. Here we halted for a second breakfast. A bottle of wine was opened, and Trösch began, as I thought unnecessarily, to uncork a second bottle, but found that they had been studying my tastes and had brought a bottle of beer for my special use. The face of the mountain above us, with the exception of the precipices just below the summit was one vast sheet of snow and ice. In ordinary seasons there are large patches of rock, but these were all covered with snow. We had to gain the ridge to the right of the peak and then turn left along the ridge. The snow was in first-rate order just letting the foot bite well, about an inch in. We gained the ridge in three long zigzags about 9, and the top (10,925) in half an hour more, the last ascent being very sharp. The magnificence of the view was indescribable. Not a cloud was to be seen; more than three fourths of Switzerland lay before us; Mont Blanc, Monte Rosa, and the whole plain of Switzerland from Neuchatel to Constance, bounded by the blue Jura. We tried in vain to find the bottle left by Herr Hoffman 17 years before. Trösch had placed it with his own hands, but it was now too deeply covered. It was first found three weeks later by another party. We enclosed our names and some remarks in a bottle, and after nearly two hours enjoyment (the thermometer was 53°) we started for the descent. The snow had grown much softer, too much for glissading, but we had some magnificent slides sitting, and by this means got down from the ridge to our breakfast place in 20 minutes. Continuing down a snow bed by the side of the rocks we gained the grass slopes, and immediately spread ourselves out on our faces to dry, the only discomfort being, as I remarked to the great amusement of the guides, that the bed was too steep. We got back to Sedrun at 2 p.m., and found the angry man had arrived in the person of Herr Meyer Bischoff, president of the Bale section of the Swiss Alpine Club. He had I believe engaged my two guides to go up this very mountain with him, and was now quite put out because they had gone up with some one else. He had come into the Etzli Thal last night in search of Trösch, and learning from his wife that he was gone with an Englishman to ascend the Oberalpstock, he hurried over the Kreuzli very early to try and meet us; but when he gained the pass,

he saw us already high on the opposite slopes. I paid Trösch 25 francs which did not seem much considering it was three days work for him. We left him at Sedrun, to make the ascent with Meyer Bischoff next day, and went down to Dissentis. It began to rain before we left, but the landlord kindly lent us an umbrella as we were going to his brother's Inn. We had some capital trout for supper, fresh from the Vorder Rhein. Next morning between 4 and 5 we started for the Brunni Pass which leads due North into the Maderaner Thal. For an hour and a half we followed the stream up a narrow valley, which then opened out into a wide undulating Alp. An hour over this brought us to the foot of a snow ravine, running up between the mountains Piz Ault and Crap Alv, and terminated by some rocks. The snow was rather steep and hard, but the rocks, once reached, were easily crossed in 10 minutes, and we found ourselves on a level with the upper névé of the Brunni Glacier. A hollow between the snow and rock afforded us a comfortable resting place. I made the height 8900 feet which was not far wrong. The Oberalpstock on our left was enveloped in clouds, but as it was about 9.30 we concluded the other party must be near the top; and Zgräggen commenced a series of jodels which were presently answered from the top or somewhere near it. We crossed the glacier, where we ought to have had a rope, and got off the ice in 1½ hours and down to Waldibalm in about 2 hours more. They had fitted up here a small chalet with three beds. Madame Indergand was here in person and did all she could to make me comfortable. We walked out in the evening towards the Hüfi glacier. The hill on which the hotel is building commands very fine views of the Dussi stock and Scheerhorn on the East looking up the valley, and on the West of the Bristentock and the mountains beyond the valley of the Reuss. On our way back we passed a small tarn in which we saw the snow views reflected in the most lovely way. I had hoped to see Trösch arrive before night, as I knew they meant to try and descend directly into the Maderaner Thal; but as he did not appear, Zgräggen engaged a young fellow, Melchior Trösch to assist us in the ascent of the Great Ruchi. As the night was warm and we feared soft snow, we started at 2 a.m., by the light of a pine torch. This on the whole gave a very good light, but it was very treacherous, and every now and then all but went out, when you were in some critical position, as on a rock in a brawling stream with the opposite bank invisible. In half an hour we were enabled to dispense with it. We followed a path up the first range of precipices to the Alp above, and then kept along the terrace between the two lines of cliff. This narrowed more and more, until some care was required: one part of it is called the bad step. In about 3 hours we reached the snow slopes leading to the Aelpli Firn, and an hour up these brought us to the upper névé, where the object of our attack made his appearance, as a small, narrow, and steep

snow ridge, surmounting several hummocks of névé which broke away right and left in blue ice cliffs. We first crossed the glacier nearly due North and then went West towards the peak. After surmounting the hummocks, which were each of considerable height, the final ridge was before us. It was so steep that the surface was coming off in small avalanches with a sizzling noise and I began to think it would be a failure. We left everything but the rope, and approached the ridge just above the last hummock where the surface had slid away most and formed a kind of furrow. I was last and being heaviest went in deep; but we got on slowly and steadily up to a rock just below the edge of the ridge. This from below looked nothing, but it took at least a dozen steps to get round it, and we were on the ridge exactly at 8.30 This ran north and south for about 15 yards, just wide enough to walk on, and a little raised at the north end where it widened out a little to a space about 4 feet in diameter where we could just stand together. To our right was the slope up which we had ascended: to our left a dark precipice: in front as we looked down the first object that met the eye was the chalets in the Brunni Thal 6000 feet below: we almost seemed suspended in the air above them. A series of jodels followed to celebrate our success (it was supposed to be a first ascent) and these were answered first by the barking of a dog from some Alp below and then by a human voice. The sky was cloudless and the view very fine but our space was too limited to enjoy it—I felt as if I could hardly turn round. At 9.15 we left the top. Trösch went down first; I followed, Zgräggen paying out the rope to hold me up in case I should slip. This operation was repeated until we were near enough to slide down on to the hummock, where we sat down and clinked glasses to our own healths and that of the Gross Ruchi. We caught a tortoiseshell here nearly 10,000 feet above the sea. After descending the monticules we went S. right down the glacier and returned by the way we came into the valley. It was excessively hot. I never traversed any glacier where the heat was more intolerable. At our journey's end, my guides mixed wine and milk and coffee with an impunity which I envied. The chalet did not furnish many luxuries, so I had some tea and then lay down awhile. I was aroused at 4 by the news that if we meant to start we must make haste as a storm was coming. Two umbrellas were provided for Madame and myself and were very useful, as the hail came down as big as cherries. It was surprising to see how quickly the streams began to swell; the inclination of the ravines down which they descend is so great. Ten minutes later we should probably have been unable to cross some of them.

Next morning I parted from Zgräggen who had been with me 16 days. I paid him, trinkgeld (20 francs) and all, 175 francs—£7, which I thought not unreasonable considering the number of expeditions we had. I had been fortunate in the weather every day we climbed; and now I was favoured with

a magnificent day for butterflies and caught them in great numbers; four kinds of Fritillaries, amongst them a Queen of Spain, Red and White Admiral, Great Tortoiseshell, some very fine Erebias, nearly black, Burnets both 5 and 6 spot, and several others of unknown species. Paphia I admired especially; I had no idea that I should find it abundant in the Forest when I got back to Marlborough.

Next afternoon I left Amsteg with regret, and went down to Beckenried, whence I made my way over the Brunig to Hof to make the promised expedition with the curé. Unfortunately I had no view on the Brunig, but it was a very pretty walk, and the quantity of wood much enhanced the near views. Murray deceived me by informing me that I should find the hotel du Brunig on the top, whereas it is at Lungern several miles off. I found the curé would be unable to start before the 20th as there was to be on that day a funeral of a man, a servant at the Grimsel, who had fallen into the Aar while crossing a new bridge, whose flooring was not complete. It happened in the early morning and escape must have been hopeless. Nothing but the most immediate help could rescue aught from death when once engulphed in that wild river. The efforts of the strongest swimmer would but prolong his sufferings. The weather was of the most melancholy character, rain and fog without a gleam of sunshine. At 12 on Wednesday, from the window of the hotel I saw the funeral train approaching. There must have been at least 200 people, chiefly men: only a few women, probably near relations, followed the coffin. The words of the landlady, 'he was his mother's support,' and the loud lamentations of the poor woman herself, sorely disturbed my equanimity. Our preparations were all made and we got away at one, after dividing the baggage between us. I carried an extra shirt and pair of socks, a piece of meat perhaps two pounds, a dozen hard-boiled eggs, two small loaves, and a bottle of wine. I think he carried more, at least he certainly seemed to have a heavier load. We took no guide with us, he said he had had too much of them and seldom spoke of them but as brigands and rascals. After crossing the valley which is here nearly a mile in width, we had a short but rather steep ascent into the Arbach Thal. I was surprised to find this open out into a wide level several miles in length and more than half a mile wide, bounded on the north by the cliffs of the Engelhörner, a magnificent wall of precipice. Of evil name are these cliffs and the peaks that surmount them. More than one bold chamois hunter has perished amongst their wild recesses. The eldest of the Laueners, the boldest hunter of that stalwart race, was one of the latest victims. For some time we had a delicious walk through meadows and cornfields. The day improved, the sun shone out, and my hopes both of butterfly and mountain success rose high. I caught a Queen of Spain and some fine

Swallow-tails; but the level at last came to an end, and the path rose steeply to the left to surmount a gorge through which the river passes. Three quarters of an hour overcame this, and we were on the Schrättern Alp, where we crossed the stream to a long grass slope surmounted by cliffs. The unstable nature of this slope was well shewn by the fact that several streams down the face of the cliff did not flow over, but right under it. We again rose rapidly to surmount the cliffs between which the stream passes; then leaving the cattle track, which climbs still higher, we crossed the faces of some rocks by a somewhat hazardous path, with good holds however for hands and feet in the nasty places. Suddenly coming to the stream, we found ourselves right in front of the Gauli glacier, the final wall of ice being within a few yards of us. The view over the upper snow slopes up to the peaks that divide it from the Unter Aar Glacier was very fine. Close to us were the chalets of the Matten Alp about 6,400 feet above the sea, which maintains about a dozen cows and a few pigs and sheep. The huts are built back into the slope so that you can walk on to the roof from behind. An inner apartment in one of them was allotted for a resting place, the outer one being tenanted by two calves and a sheep, who seemed disposed to resent our intrusion. After effecting what change we could in our dress, we went to another chalet where the day's milk was already over the fire. Refreshed with some bread and warm milk I sat by the crackling blaze and watched the operation of separating the curds from the whey. The first skimming of the milk, brousse, or zieger, as it is called, is very delicious, like a fine trifle, and I almost eat too much of it. There were two boys in the hut about 14 and 10 years old. They were much interested in the butterflies and the aneroid barometer which I in vain endeavoured to explain to them was not a watch. The curé soon dropped asleep, which I was not sorry to see, as he had complained of fatigue on his way up, and seemed feverish and exhausted. When all the curds had been scooped out of the caldron, the whey was poured off and all the inhabitants of the chalet, visitors excepted, washed their hands and faces in it. The herdsman then went out with the pail, and gave a long whistle. This was to summon the pigs, who came at full gallop and as many as could thrust their snouts in. The man saw justice done and kicked out the stronger when he thought they had had enough. This man was to be our guide for the next day; he said it would be 6 hours up, and as many down as it was so rocky. Further that he could not start before 6 as he had his cows to milk. This dismayed me, as it seemed to threaten us with another night at the alp, so the curé said he would try and find some one else in the morning. We got settled very comfortably in our chamber. They gave us a good heavy coverlet, which was most useful, as the cold was very sharp. The night was splendid, we could see the stars glistening brilliantly through the

holes in the unmortared wall. The murmur of the glacier stream was our only lullaby. I soon fell asleep and slept for nearly 5 hours and was quite undisturbed by the enemies I dreaded. We got up about 5 and the curé went off to seek another guide, and presently returned with Andreas Neiger, who had been before with him on the Hangendhorn, the mountain that stands out so finely as you look from Hof up the Urbach Thal. I went down to wash in the glacier stream close to its exit from the ice, and precious cold it was. We got off only at 5.45 accompanied by the two boys. The lower part of the mountain is a series of slopes alternating with lines of cliff. The upper part for at least 2,000 feet was a series of countless rocky pinnacles. Turning right and left as required to avoid the cliffs, we got amongst the rocky points in about three hours. Here began a miscellaneous scramble, with no particular difficulty, occasionally only requiring the use of hands as well as feet. We bore to the left, towards the lowest point in the ridge. Here all our provisions were left and the two boys forbidden to go further. The rest of us followed the ridge southwards to the summit. This was rather more difficult as it was narrow and rugged and we could not always follow the top. The highest point (10744) was gained in 10 minutes—making 5¼ hours from Matten, only we wasted some time at a crystal hole, where I broke the spike of my alpenstock. The East face of the mountain goes down with frightful steepness into the Harli Thal. Looking at it, I could not conceive how we could have ascended on that side as proposed in 1861. The only way would have been to gain the ridge at a point a good deal N. or S. of the top and then to follow the crest. The view again was singularly good. The whole valley from Briens to the Grimsel was spread before us like a map. We sat for some time enjoying it in the utmost comfort, as the temperature was 52°. Both white and brown butterflies were hovering about. Returning to our fellow-travellers, we all got the most comfortable seats we could and prepared for dinner. From this point we could see Hof and the parsonage nearly 9,000 feet below. The curé told us it was his wife's birthday, and we all drank her health at a higher elevation than her friends usually did it. He however was not satisfied with this but kept continually waving his glass in the direction of the house and exclaiming 'Happy wishes! Happy wishes!' he also amazed me by beginning to talk English, not getting however beyond 'How do you do?' and 'What o'clock is it?' Altogether we had a very pleasant meal. We left soon after 12. On the way down little Hansli, the smaller boy, caught the smallest (?) fritillary I ever saw, with a very purple hindwing; he was a most active little boy, and ran admirably down the rocks, selecting with unerring instinct the spot were he must bring himself up. On the slopes above the chalets are found some fine patches of Edelweiss, which everybody prizes. Got down to

Matten at 3 p.m., in less than 3 hours instead of 6, and after a long rest and some coffee, paid our bill (only 12 francs for guide, board, and lodging), started for Hof at 5 and got down there at 9, after a most pleasant day. I was much pleased with the hearty and kindly way in which all the parishioners welcomed the curé.—They all seemed to be on such affectionate terms with him. Next morning after going in to say good-bye to them, I walked down to Brienz, and took

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— A Portion of Specular Iron, by W.

Entomology — A Box of Insects, captured this year, by H. M. Hilton.

A Centipede, which had exhibited Phosphorescence when alive, by H. Almack.

A collection of Chinese Butterflies, by H. Manders.

A Diamond Beetle, by E. C. Sewell.

A "Wood Barata," a large and venomous Insect from Rio de Janeiro, by the President.

Archæology—Some Roman Pottery from Westmoreland by G. G. Monck.

A curiously shaped Clay Pipe, found in Savernake Forest by — Giles.

A British funeral urn by E. Almack. A collection of Coins, by H. M. Hilton.

Botany—Preserved Figs from Georgia, by E. S. Preston. Excrescence of Wood from Savernake Forest by H. M. Hilton.

There were also exhibited a Chinese Visiting Card by J. B. Fuller; a Seamouse, by B. J. Guillemard; a portrait of an Aborigine from Rio de Janeiro, by E. C. Sewell; and a Caucasian Dagger by T. Kensington Esq.

A paper was then read by E. Almack on Avalanches.

There were 73 persons present—4 Hon. Members, 23 members, and 46 Visitors.

MEETING HELD APRIL 17TH, 1868.

THE following donations were announced and thanks ordered to be given to the Donors.

A very valuable and extensive collection of British Fossils, by Professor Sedgewick, F.R.S.

Specimens of ancient pottery, from Bingham, in Nottinghamshire, by P. F. Miles.

THE Heads of Sections gave their reports:

EXHIBITIONS.

Entomology.—A Mole cricket, by the President.

Geology.—Specimen of "Plum-pudding" stone, by E. Almack.

Archæology.—A collection of coins, by — Thurnam.

Model of an Irish cross from Kelso, Co. Meath, by H. M. Moule, Esq.

Ornithology.—A pair of Water Ouzels, by E. im Thurn.

Botany.—Specimens of Rye straw and plait, from the Orkneys, by the President.

Zoology.—Specimens of coral, from the Pacific, by H. A'Court.

A Tiger's skull, by the President.

H. M. Moule, Esq., then read the following Paper on

NATURAL HISTORY IN THE FOURTEENTH CENTURY.

DEEPLY interested as many of you have learnt to be in the details of natural knowledge—in the processes of observing, collecting, and classifying—it becomes in my mind the more desirable for that very reason that you should sometimes take more general and more extended views of what you are about. I believe that every student of Natural History, for instance, would be at once an abler inquirer and a better educated man, if he were to embrace any opportunity that occurred of becoming informed about the history and the literature of that branch of knowledge. To learn how many ages ago the first germs of what we call modern inventions or discoveries were lying hid in the human brain, and were even produced in literature; to learn how often mankind has, as it were, just touched the port or harbour of some great discovery, and how then by the merest accident speculation has been driven far out to sea again; to notice how comparatively powerless the most gigantic intellects have been in bygone days for want of instruments or processes which to us are matters of familiar use: this, it seems to me, is to imbibe the very essence of the educating influence that flows from Natural History. This is an influence which imparts an even balance to the mind: and enables us to make a just estimate of our own powers and our own times. By the side of Aristotle, many naturalists who have rightly enjoyed considerable reputation in modern times, are but pigmies But their *knowledge* as compared with Aristotle's knowledge is as a fully developed figure to an as yet unformed fœtus. In this I read, not the littleness of Aristotle, but the greatness of God, and of his agents, Time and gradual Developement from causes to results.

It is with thoughts such as these that I invite your attention for a few minutes to some remarks on Natural History as it existed five centuries ago. That is to say, in the time of Chaucer and Gower, and Langland and Wiclif: the time of Edward III and Richard II; the age of thought and progress that, with the single exception of the 16th Century, forms perhaps the most remarkable epoch of any in our national annals.

I wish to show you that, notwithstanding the greatness of that epoch, natural studies were then still in an infantine stage of progress. I wish to show you that partly as they were derived from ancient sources, and partly as the product of the times themselves, the researches and the beliefs of that age teem with absurdities and puerilities. And I will show you that this was the case, not from any want of power in the men but because the researches were based on no principle at all, or on erroneous principles.

I propose by way of text, to read you a few lines from Chaucer's Prologue to the *Canterbury Tales*. These lines describe the "Doctor of Phisik," and

incidentally give us some extremely interesting information about the books, and methods, and objects of natural knowledge in that age: —

Ther was also a Doctour of Phisik,
In al this world ne was ther non im lik=
To speke of phisik and of surgerye:
For he was grounded in astronomye.
He kepte his pacient wondurly wel
In houres by his magik naturel
Wel cowde he fortune the ascendent
Of his ymages for his pacient.
He knew the cause of every maladye
Were it of cold, or hete, or moyst, or drye,
And where thei engendrid, and of what humour;
He was a verry perfight practisoner.
The cause i-knowe and of his harm the roote.
Anon he yaf the syke man his boote.
Ful redy hadde he his apotecaries,
To send him dragges, and his letuaries;
* * * * * *
Wel knew he the olde Esculapius,
And Deiscorides, and eeke Rufus:
Old Ypocras, Haly, and Galien:
Serapion, Razis, and Avycen:
Averrois, Damescen, and Constantyn:
Bernard, and Gatisden, and Gilbertyn.

To paraphrase some of the more difficult of these lines, they would run thus:—

"He had a good knowledge of the heavenly bodies. He was thus able to portion out wonderfully well to his patients, by this scientific knowledge of nature, the most favourable hours for taking medicine, or for undergoing operations. He could also construct magical images for the benefit of his patients, selecting with skill, when they were making, that conjunction of the heavenly bodies which would be most favourable to the patient's case. He was an adept in the four elemental conditions of the atmosphere, cold, hot, moist, dry; and in the four humours, blood, phlegm, choler, melancholy. As to his library, he was well acquainted with both the Greek and Arabic physicians and natural philosophers."

Now I beg your attention to the last sentence that "as to his library, he was well acquainted with both the Greek and Arabic physicians and natural philosophers." There are few chapters in the history of the human mind, as it has been truly said by Dean Milman, more interesting than the propagation of Greek learning in Europe by the Arabs, and the influence of that learning upon themselves. Between the 8th and the 12th centuries there came sweeping over Europe and settling in it tide after tide of remarkable Orientals. Settling first in Spain and spreading their influence by and by from thence to France and Italy, they form a link between the worlds

of ancient and modern thought, and in particular they handed down the lamp of natural learning from the age of Aristotle, from Hippocrates and Galen, to the age of Bacon, and Cuvier, and Linnæus, and Harvey, and Ray, and Sydenham.

The "Doctor of Phisik," you will remember, had in his library the works of Avicenna and Averrhoes. These are the only Arab names of the list that I need trouble you to remember, but these should be remembered.

Avicenna in the 11th century and Averrhoes in the 12th, spread abroad the knowledge of Aristotle in all parts of civilized Europe. Their influence and intellectual position may be inferred from the fact that they are placed by Dante among those who needed only baptism (they were Mahometans) to be saved. How extremely well suited they and their school were to be the exponents of Aristotle, who wrote so widely both on mental and physical knowledge, will be gathered when I say that every Arab philosopher was a physician, and almost every physician a philosopher.

Now these men, as I say, and several generations of similar men of whom these were the greatest, read, translated, explained and introduced to the west the works of Aristotle, and in particular his physical works, his natural science treatises. Hippocrates and Galen were also much in request among them; but Aristotle, who was the contemporary of Hippocrates (though many years younger) and the inspirer with him of Galen, supplied the Arabs with their chief material, and was in their eyes incomparably the greatest figure in the ancient world.

Let me just insert here a few facts of year and date about these men. Aristotle died in 322. Hippocrates had died 35 years before at a very great age (104); so that he had actually been in full practice in Attica during the Peloponesian war. Galen, a native of Pergamus, in Mysia, was a contemporary of the Roman Antoninus, and died A.D. 200.

You now have, if you followed me with any distinctness, a sort of chain or series of great names, from Avicenna, Averrhoes, and Razis (in the 12th, 11th, and 10th centuries) back to Galen in the 2nd century and Aristotle and Hippocrates in the 4th before Christ. And as the European natural science of the 4th century was still almost entirely coloured by the Arabian philosophers, and as they in their turn were the faithful exponents of Aristotle, it will give you a fair and clear idea of 14th century principles if I take Aristotle, and (chiefly by the aid of Mr. Lewes's treatise on his Natural History Works) explain to you what his position towards science really was.

You will then understand what a gulf lies between ourselves and even our predecessors of only five centuries ago. You will be aware not only that there is a shorter interval between the 14th age A.D. and the 5th B.C., than be-

tween the 14th and the 19th A.D., but that while the science of the 14th age was to all intents the same as that of the 4th B.C., that of the 19th century in which we now live has become possessed of principles and methods simple, wonderfully simple, in themselves, but which may lead us into wider and wider fields of truth by an onward progress of which it is impossible to foresee the end.

Aristotle then, the father and founder of Natural History as it was known to Chaucer and his contemporaries, was the greatest Greek of the 4th century B.C. He was born 384, and died 422. A native of Stagira in Northern Greece, he spent the greater part of his life at Athens, when intellectual life at Athens was at its highest. He was a pupil of Plato's, and, what perhaps had quite as much influence on his after career, he was for four years private tutor to the young Alexander. I say that this exerted great influence on his later career, because in addition to the splendid money payment which he received as his fee, (perhaps £200,000), he received from Alexander the power of making his magnificent and enormous collections in natural history. We are told by Pliny, that Alexander gave orders to his hunters, gamekeepers, fishermen, and birdcatchers to furnish the philosopher with all the material which he might desire,—an order which at once placed several thousand men at his disposal. And remember that this was no stationary force; but that this grand squadron of collectors moved with Alexander from the western regions of sunny and teeming Asia Minor, across the valley of the Euphrates, through the steppes to the east of the Caspian, and on to the very confines of the Himalaya region. Large exaggerations were probably made, and must certainly be allowed for in this and every other statement about Aristotle's collections, but it is unquestioned that in a greater or less degree, the resources which I have mentioned were at the disposal of Aristotle for several years.

Add to this, in your conception of Aristotle, that he possessed a force of intellect which made him the leading mind in European thought nearly two thousand years after his death: and which was capable of sweeping, not one science or one branch of thought only, but the *omne scibile*, the whole cycle of human knowledge. His influence, it has been truly said, has never been exceeded except by the great founders of religions. Yet the sum total of his vast labours, when weighed and tested by the positive evidence of modern science, appears insignificant when not absolutely erroneous; and the humblest investigator in our or any other association is now able to take a point of view which Aristotle was unable to take, as well as instinctively and unhesitatingly to reject mistakes which would have led Aristotle astray. And when I say Aristotle, remember that I include the many generations of active thinkers and workers in Natural History who followed him, and whose methods were in active operation so late as the 14th century.

Now let us proceed to take some examples of this extraordinary feebleness in so great a man, and then to ask the reason of it, and of the superiority which now lies within our own reach.

To begin with, Aristotle had never dissected the human form. Even Galen, a professed doctor, who lived five hundred years later, had probably never done so. But Aristotle had never used a scalpel. He had certainly no idea at all of the facts of our blood system. He did not know the difference between a vein and an artery. He did not know that we have such things as muscles, and he was a complete stranger to that grand wonder of the human frame—the nerve system, which springing from the prime nerve centre (the brain) is spread in countless ramifications into all parts of the body.

Aristotle knew nothing whatever of the true process of digestion; but he had a theory, observe that, and this was his theory: He held that the stomach was a kind of natural stove, and that in it the food was *cooked* by the animal heat. In the distribution of the nourishment which we receive, he taught that nature acts like an economist, that as freemen eat the prime portions at meals, slaves the inferior parts, and dogs the offal of an animal, so the nobler organs of the body (flesh, the senses) receive the sweeter parts of food, and the baser organs (bones, hair) the more bitter.

Here are a few instances of his erroneous beliefs in very simple matters. In man, in sheep, goats, and swine, he remarks that the male has more teeth than the female. In this perfectly erroneous position he was perhaps confirmed by a few exceptional cases of malformation. Again he has the hardihood to tell us that the heart lies *above* the lungs, in which case perhaps I need hardly tell you that we should, always in fact, instead of sometimes in a figure, have our hearts in our mouths, or at any rate a very large lump in our throats. And he states that the heart of the ox is peculiar, for that there is one kind of ox which has a bone in the heart, and in the heart of the horse there is also a bone.

He was weakest of all perhaps in what he says of the brain. The actual facts about the brain are these. This wonderful and perfect organ completely fills the cavity of the skull from front to back, the lesser portion of the brain substance (known as the cerebellum) lying in the back part of the skull; and further, more blood goes to the circulation of the brain, than to that of almost any other organ of the body. The healthy circulation of blood through the brain is in fact one of the very first of all important conditions on which bodily vigour and efficiency depend.

But by Aristotle it was believed that there is no blood at all in the brain, a clear proof that he could never have seen one, as the red spots denoting vesicles containing blood, and the numbers of minute vessels that traverse the

surface of its substance, are plainly to be seen the moment the organ is laid bare. It was further his expressed belief that the back of the skull is quite empty.

One more instance and I have done with specimens of a list with which a laborious student of Aristotle's natural works might fill a volume. He informs us that "if a woman suffering from scarlet fever, look at herself in a mirror, the surface of the mirror is suffused with a kind of bloody mist and that the mist, if the mirror be quite new, cannot be rubbed off without difficulty." This was probably one of the old wives' tales of his day, and Aristotle had never taken the trouble to ascertain its truth.

And this leads me to the main point of these remarks on Aristotle, I mean the *reason* of all this queer and strange error in a man so versatile, so active, so great.

The reason in two words was this, that with all his greatness he did not really know what it is to ascertain truth. He loved truth intensely. He has a maxim that it is our duty to sacrifice even our own flesh and blood when the cause of truth is at stake; but he did not know the nature and value of two things which to you are most familiar terms—*correct observation* and *complete verification*.

These are two terms, indeed, but they represent one and the same thing; observation is verification begun, and verification is observation completed.

Now Aristotle went without verification for two reasons. First, he did not feel the want of it. This was universally the case in ancient times. It was the case in the fourteenth century. It was the case until the long cycle of mistaken methods ran out, and the true principle of slow, patient observation was developed chiefly by Bacon, and after him by many other great names, in the 17th century. The philosophers who went before, from Aristotle downwards, were like mariners without a compass. It is Bacon's own remark that men had to coast along shore till they discovered the mariner's compass. He might have added that, on the ocean of truth, the ancients too often daringly struck out without feeling the want of a compass, and almost invariably went wrong. That compass is *verification*.

Aristotle did not feel the want of this compass, and that is the first reason why he went without it. The *second* reason is, that he had no useful workmen who could construct it. In other and plainer words, he had none of our modern instruments without which observation and verification in the right and only useful degree are impossible.

Take meteorology. He did indeed hit upon the fact that heat is the chief agent in meteorologic changes. But this was a guess. He could carry it no further; he could not test his guess by observation, for he had no thermometer

to measure the heat of the atmosphere, no barometer to measure its weight at different times and places, no aerometer to measure the velocity of atmospheric current, no hygrometer to measure the quantities of vapour, and lastly he had no instrument by means of which to *establish* and *test* the presence of electricity, of which he knew nothing, but which plays as we know an important part in meteorologic phenomena.

And thus it was through failing to perceive the paramount need of verification, and being destitute of the means whereby to attain it, that this man of gigantic genius and industry has broken down, if we look merely to the scientific results of his labours. Thus it is, that though politicians, and metaphysicians are and always will be among his eulogists, you will find no modern astronomer, no physiologist, no chemist.

And now to come back more directly to the 14th century, can you wonder that the Aristotelian method of natural science, defective as we have found it to be, even in the hands of its amazingly powerful originator, when it came to be transmuted first through the hands of Mahometan believers like Rhazis, then of Mahometan sceptics like Averrhoes, then of Christian mystics or thinkers like Albert the Great and Thomas Aquinas and Roger Bacon, and then of Christian ignoramuses or schemers whose names are legion, should have furnished forth to the later middle ages all that vast tissue of curious research and assumption and half-sense and utter nonsense, which we sum up in the two names Alchemy and Astrology.

The shaky and feeble anatomy and physiology of which we have had some examples, the keen pursuit of the *elixir vitæ* or essential principle of life, and of the philosopher's stone, which was to change all baser metals into gold; lastly, the half awestruck, half sharp-practice-like exploration of the heavens, with a view to divine their influence on the destinies of persons or of communities and to obtain the means of acting on or with that influence, the "magic naturel" of the worthy doctor in Chaucer; this fairly sums up to you what Natural History was in the 14th century—an age which you will remember was one of our foremost periods of national greatness—an age as I just now observed, full of military and statesmanlike activity and strength, full of energy and progress in the world of thought.

Before quitting the subject, let me briefly put before you a few simple thoughts illustrating the impossibility (not absurdity) of astrologic science. The position of the heavens at the time of birth settled every man's character of body and mind, the various fortunes he would meet with and his position towards friend or foe. Anyone, therefore, born at or very near the same time as Alexander the Great in the same country might have had a right to expect a somewhat similar career. Twin brothers would never fail to have the same

horoscope; their careers must therefore be always the same. Again, to take a simple case; suppose two men have engaged to throw dice against each other for their whole fortunes. Suppose that each goes over-night to consult a different astrologer in the same town; to them (on a sudden emergency) it might not be necessary to exhibit their horoscopes; the present position of the heavens would be enough to point out a favourable hour; and thus if both astrologers worked by the same rules, which they ought to do, both would arrive at the same result, *i.e.*, the same course would be recommended to both inquirers, though one must certainly lose. In spite of these obvious drawbacks, astrology, no less than Alchemy, found earnest votaries among high and low, ignorant and learned alike. The pursuit of Alchemy was constantly stimulated by infatuation, avarice, and some cases of apparent success. If it made but little gold, it at any rate made away with a vast deal. Pope John XXII was a notorious adept. At the Dissolution, the monasteries were still found widely practising the art.

And now, when you consider weakness and strength, strength and weakness, side by side—when you remember that this 14th century was an age that even in these very studies could boast a depth, an active vigour, and an originality which we can scarcely pretend to equal; that beyond their range it produced poetry like the *Canterbury Tales*, a spirit of enterprise like that of Sir John Mandeville, soldiers like Edward and his eldest son, architecture like the spire of Salisbury; and when on the other hand you consider not too rigidly but sincerely and truthfully how little our splendid intellectual position is due to the efforts of our own or of any single age, to say nothing of the shortcomings even of that position, do you not feel the calming and sobering influence that you sometimes feel in presence of nature herself?

There is methinks but one language to express our sense under such influence of our own comparative littleness and of the greatness of what lies beyond. It is a language in which the devout man and the philosopher can alike unite "Wonderful are thy works, O God, and that my soul knoweth right well."

There were 60 persons present—4 hon. members—19 members, and 37 visitors.

MEETING HELD MAY 1st, 1868.

Archæology.—G. G. Monk exhibited the coins at present in the collection of the Society.

Geology.—E. Almack exhibited a specimen of *Inoceramus*, from Oare Hill.

Entomology.—F. J. H. Jenkinson gave his report.

Ornithology.—E. Almack exhibited the skull of a Rook *(Corvus frugilegus)*.

Botany.—The President passed round a list of notices for the month of April.

G. Holden exhibited specimens of Moonwort *(B. lunaria)*.

Zoology.—The President exhibited specimens of the Roman Snail (H. Pomatia) found at Ramsbury by T. E. Maclean.

The President also exhibited some Alum Shale and Alum from Whitby.

The Librarian announced the donation to the Society of the "Birds of Bucks and Berks," by H. R. H. Prince Leopold, and of a second copy of the same by the Rev. R. Duckworth.

The President then read the following Paper, written by J. W. MILLS, Esq., on

THE INSTINCTS OF ANIMALS.

THE subject, which I have the pleasure of bringing before you this evening, is one which is well calculated to rouse the attention of all members of a Natural History Society, particularly because it refers to, as it were, the connecting link between man and brute, the verge on which reason and these wonderful powers, which an all-good Creator has given to the inferior creation, come into close contact. Nor is Instinct a faculty which is to be found in a few only of the brute creation; it seems to be the property, though in various degrees and different forms, of nearly all the creatures who are less gifted than the human race. From the little ant which works so industriously at our feet to the mighty elephant which roams through the forests of India and Africa, crushing the frail underwood before him, and trampling on myriads of little creatures no less gifted, perhaps, than himself, we find in all these certain passions, and certain instincts which we may well examine into and admire. Now I propose to divide my paper into various heads as I go on, and with an anecdote or two in each, try to impress upon you all that the human race is not the only one which is gifted with senses and feelings. Aristotle tells us that beasts and infants remember—that is recognize—and that man alone recollects. These distinctions, hard no doubt to define, are scarcely however borne out by fact, for in animals which have been trained to any particular purpose, the faculty employed in its performance must be more than recognition, which can only apply to a material object. A dog will recognize its master, but it must be an effort of recollection which enables it to perform the tricks it has been taught, or the services it is called upon to render. Most animals recollect injuries they have received and this cannot be recognition. The dog will recognize the person who has inflicted the injury; but there is something beyond the recollection, namely, an association of something more, that it suffered ill-treatment from him. Now this faculty is entirely distinct

from *instinct proper*, which in animals is equivalent to the reason and mental power in man, and which teaches them the means of self-preservation by migration, hybernation, and concealment, the periods for propagating their species, and the contrivances for taking care of their young; and the difference between these—reason and instinct—is this: *Reason* has an object or aim in view, founded on some mental calculation or desire, the result of some wish or will of the moment, while *instinct* is a blind impulse, which compels the animal to certain actions capable of being modified or suited to circumstances without depending on them. However, by the heading I have given to my paper you will see I have included other faculties under the term *instincts*, and as such I wish to class them, though perhaps I may, strictly speaking, be giving a wrong name to these wonderful powers; and really a subject of this sort is a truly marvellous one, the closer we look into the ways and means of the animal world the more we see to marvel at, and to use the words of a great writer, 'The more we know, the more we see our ignorance."

The first branch of the subject I would bring before you, is *instinct proper*. Now this I have already said corresponds to our reason, and in some cases appears almost, if not quite, identical with it. It is however not capable of improvement, but at once assumes the highest range to which it can rise; for perfection is only to be gained by experience, and to that the faculty of thought is essential; in fact, a desire (founded on the clear perception of the object desired), seems to be instinct. As an exemplification of instinct I will relate a story that was told me by a gentleman a little time ago, of the authenticity of which I have not the slightest doubt.

A lady residing in Staffordshire was presented by a friend with a little pig. This friend lived some 4 or 5 miles off, and between the places where each resided was a considerable town near which a river flowed, which had to be crossed by a bridge. This pig was conveyed to the house of this lady in a cart along this road, over the bridge (to reach which somewhat of a detour had to be made) through the town, and reached the house all safely. The next day piggy seemed very restless, and the day following he was missing, and news soon came that he had returned to his old and favourite stye across the river. Well, he was brought back, he again appeared restless, and so this time the gardener watched him. He saw him deliberately make his way out of the yard, and go on through the town to the river, *not along the high road* but in *a straight line* to the house from which he had first been taken, swim the river, and proceed thence to his old stye with, as it seemed, intense satisfaction to reach his old home again.

This really seems to be a wonderful example of instinct. What particularly strikes one is the pig's returning—not along the road and over the bridge, the way he had come—but by a straight cut *through* the river.

An instance, however, which will shew that this wonderful power is not equally present in all creatures will, I think, be afforded in a letter published some years ago superscribed, "The Shade of Isaak Walton to the fishes of the Thames," which was as follows:—"I will tell you a pleasant story, it happened to myself as I once sat on a bank a fishing; a certain wicked perch that had a design upon my bait, (for, as I have already told, fishes do not bite to please anglers, but to please themselves), was approaching thereto, when suddenly pulling my line out of the water, I caught him (which made me very sorry) by his very eye, which came, to my real grief, clean out of his head, and in this my grief I think I was to the full as sincere as they that make, as it were, a trade of sorrow. But for this fish, I thought him to be like those soldiers or sailors that having become maimed, whether in a good or bad cause, did deserve a relief from all future wars, so I quickly returned him to his native element, there to abide his chance to meet no more with hook or line; but mark my wonder, when returning my thus ready baited hook to the water, and with this so singular bait (*i.e.*, his own eye) I caught the next minute the self-same perch, who thus became so like a phenomenon that he had one eye in his belly and the other in his head." If this story be true, the fish must have been utterly devoid of sense of all sort to be so infatuated as to bite at his own eye.

Cuvier relates the anecdote of an ourang-outang in the menagerie at Paris, which was in the habit of opening the door leading into a dining-room, the lock of which was out of its reach, by lowering itself by a rope fastened to the ceiling. This being observed the cord was fastened by means of several knots, but the animal seeing the reason, and at the same time perceiving that by hanging beneath them he drew them tighter by his weight, climbed above them and loosened them with ease. It also unlocked a door by trying every key in a bunch till it found the right one, and if the lock was too high it fetched a stool and mounted on it.

Lemet also saw a monkey escape from its cage, run through a gallery, and bolt the door after it, and then conceal itself in a closet *from which it first took the key*.

Now does it not seem that in both these cases the animal must have made use of actual thought and reason to accomplish what it did.

Leaving now the subject of instinct proper, I will now remind you of their *affection*, both for their young and for their masters and preservers. We all know the artifice employed by the Lapwing to ward off danger from the proximity of her young, how she will rise from the ground with a loud screaming voice as though from her nest, though probably not within a hundred yards of it. She now flies with apparent anxiety, making a great noise, striking at the invaders with her wings, and flying apparently wounded a few

yards in front, and it is a curious fact, and one worth remembering, that the nearer one gets to the nest the less she cries.

Hence round the head—
Of wond'ring swains, the white wing'd Plover wheels
Her sounding flight, and then directly on
In long excursion skims the level lawn
To tempt them from her nest.

A story is told by Mr. Markwick that as he was once hunting with a young pointer, the dog ran on a brood of very small partridges. The old bird cried, fluttered, and ran tumbling along just before the dog's nose till she had drawn him to a considerable distance, when she flew further off, but not out of the field. On this the dog returned close to the place where the young ones lay concealed in the grass, which the old bird no sooner perceived than she flew back again, settled just before the dog's nose, and a second time rolling and tumbling before him succeeded in drawing his attention off her brood, and so preserved them. We all probably remember the account which Captain Cook writes of the affection of the female walrus, which will defend the young one to the very last at the expense of her own life, nor will the young one quit the dam though she be dead; so that if you kill the one you are sure of the other. He mentions in the account of his third voyage, on returning from Behring Straits; "Our people were more successful than they had been before, returning with three large ones, and a young one. The gentlemen who went on this party were witnesses of several remarkable instances of parental affection in these animals. On the approach of our boats towards the ice they all took their cubs under their fins and endeavoured to escape with them under the sea. Several whose young were killed and wounded and were left floating on the surface, rose again and carried them down, sometimes just as our people were going to take them into the boat: and they might be traced bearing them to a great distance through the water which was coloured with their blood. We afterwards observed them up at times above the surface as if for air, and again diving under it with a dreadful bellowing. The female in particular, whose young had been destroyed and taken into the boat, became so annoyed that she attacked the cutter and stuck her teeth through the bottom of it:" and then follows in the record of another expedition the touching description of the way the other Polar Bears came up and mournfully licked over their cubs which had been killed and left for a short time on the ice.

Mr. Anderson in his "Recreations in Agriculture" says that the Russian shepherds avail themselves of the attachment of ants to their young for obtaining with little trouble a collection of their pupæ which they sell as a dainty food for nightingales. They scatter an ants' nest upon a dry plot of

ground, surrounded with a shallow trench of water, and place on one side of it a few branches. Under these the ants, having no alternative, carefully arrange all their pupæ, and in an hour or two the shepherd finds a large heap clear and ready for sale.

So much for the affection animals feel for their young, and I think I need hardly illustrate the affection which dogs and horses feel for their masters. We all know the story given so beautifully by Sir W. Scott of the dog who, when his master was lost on Helvellyn, kept watch over the body without leaving the place for more than three months: but to show that this feeling is not confined to dogs and horses I will mention a story told by Mr. Johnson in his "Field Sports of India." He says 'Two Biparies (dealers in grain) were driving a string of loaded bullocks to Chittrah from Palamow, and when they were within a few miles of the former place a tiger seized a man in the rear, which was seen by a guallah (herdsman) as he was watching his buffaloes grazing. He boldly ran to the man's assistance, and began to cut the tiger severely with his sword, on which he dropped the Biparie and seized the herdsman; the buffaloes observing it attacked the tiger, and rescued the poor man; they tossed the tiger about from one to the other and killed him. The Biparie recovered, but the herdsman died.' Elephants too, we know, are wonderfully docile and affectionate: and Sterne in his 'Sentimental journey' tells us of the man mourning for his dead ass, which ass, he said, he was assured loved him.

We all see then that animals shew extreme affection for their young, and also for their masters in a great many cases.

Fear is another feeling which has great power in the animal world.

We hear of the effects of the Rattlesnake's terrible eye: how by merely keeping its eyes fixed on a squirrel it compels it to come down from the top of a tree, and then kills and devours it. M. La Vaillant tells us a story of a shrike, also of a mouse, falling victims to fear at the sight of a rattlesnake. He saw on the branch of a tree a species of shrike trembling as if in convulsions, and at the distance of nearly 4 feet, on another branch, a large species of snake which was lying with outstretched neck and fiery eyes, gazing steadily at the poor animal. The agony of the bird was so great that it was deprived of the power of moving away, and when one of the party killed the snake, the bird was found dead upon the spot, and that entirely from fear, for upon examination it appeared not to have received the slightest wound. He also tells a similar story of a mouse in similar circumstances, which, when he frightened the snake away, immediatly expired in his hand. There is rather a peculiar story told in Captain Alexander's 'Transatlantic Sketches' of two rattlesnakes which a stout negro, belonging to a friend of his, brought from the bush in a

box. They became completely subdued by intimidation, and after a time he would let them out in the verandah, and they would return when he called. One day they were missing; the negro's master on going to an outhouse saw them coiled up close under the step of the door. He was a long time in a terrible fright, but at last sprung into the open air over them and sent the negro with his box to catch them. So he went out and on on seeing them called out "ah! you d—— rascal, you go away! get in house this minute!" and the reptiles obeyed him. If this be true, the tone of the man's voice must, I suppose, have been attended with such fear to the creatures that they obeyed him.

Impulse for food is another instinct which we see strongly marked in all the members of the animal world, excited, as it is, by the cravings of hunger, in itself more ferocious than the animals themselves. This natural craving and its means of gratification is well commented on by Mr. Kirby, who says that nothing affords a more striking proof of creative wisdom and of the most wonderful adaptation of means to an end, than the diversities of structure, with a view to their particular functions, meaning the different modes by which animals procure their food. He then goes on to describe the various organs for swallowing and digesting in different animals.

Stratagems are employed by various creatures with a view to obtaining objects to devour. The pit-falls of the ant-lion, the webs and nets of the various sorts of spiders spread over the trees, the fascination of the rattlesnake, which I have already mentioned, furnish instances of stratagems to secure their daily food. Others, birds, &c., obtain their food from berries of trees, and Mr. Dampier in his travels tells us that when seamen are thrown upon any of the unknown shores of America, they never venture upon the fruit of any tree, however tempting it may appear, unless they observe that it is marked with the peckings of birds; but eat it without apprehension where the birds have been there before them.

What wonderful powers of perception these herbivorous and graminivorous creatures must have to be able to choose the right food and no other. Linnæus tell us that the horse eats 262 plants, and rejects 212, the cow eats 276, and rejects 218, the goat devours 449 and declines 126, while the sheep takes 387 and rejects 141, the hog, however, being more nice in its provision than any of the former, eats only 72 plants, and rejects 171.

The great majority of carnivorous animals reject dead substances. Our cat at home, for instance, utterly refuses a dead mouse, while she particularly admires a live one.

The craving for food varies considerably in respect to time. Herbivorous animals can only endure fasting for a very short period, while the carnivorous

can exist without food sometimes for weeks. Horses and the ruminating animals sink through hunger at the expiration of a week at the latest. We are told, that in a Baltic Trader from St. Petersburg to Leith a cargo of flax was put on board, and when this was unloaded a cat was found in one of the bundles, and much compressed within it, but still alive, though this was 38 days after the vessel started. The ant-lion, whose pit I mentioned just now, can fast for half a year after its last meal.

Migration is, to a large extent, caused by the necessity of seeking food. As soon as herbage and green food begin to be destroyed in any place by the frosts and snows in winter, the various animals wander forth to a warmer and more congenial atmosphere.

The Lemming rats, which inhabit the mountains of Norway and Sweden, and multiply very largely there, emigrate as Linnæus says, about once in ten years, and travel regularly in a direct line from N. to S.W., causing destruction to herbage wherever they pass. They keep on their course in a perfectly straight line, swimming lakes, and passing over vessels, if in the way, and curiously enough move chiefly by night or early in the morning.

The Passenger Pigeons' wonderful flights, are also actuated by the same impulse of food; driven by necessity they change their situations in search of acorns, mast, and berries, and where they alight, the ground is quickly cleared of esculent fruits.

The *Sagacity* of creatures, particularly *dogs*, is a trait of their character which is noticed so generally that it would be out of place to dilate long upon it here. However I will relate a circumstance which I myself witnessed last summer in our yard at home.

I was looking out of a window and saw a fox-hound come into this yard. There were several of these dogs kept by the farmers in the village, and all regarded with disgust by us, especially as one would frequently come into our premises on the chance of bones, and would in so doing frighten the fowls, &c., extremely. The gate by which the dog came in happened to be open, but almost directly afterwards the gardener went out, and not seeing the dog, shut the gate, which is one of the sort that swings backwards and forwards; it swung to, but did not latch. After a time the dog wanted to go back again, but unfortunately found the gate too high for him, as there were pieces of wire netting at the top to keep the fowls from flying over, and so went snuffing about trying to find a place to jump over. This he failed in doing, and so returned and began to push the gate about, and finding it somewhat loose tried to push it forwards and squeeze through after it, but it being a considerably heavy gate he could not get it far enough, though he tried some dozen times. So then he tried another plan. He pulled it back and tried to run round it

and squeeze through before it closed again, but he always found it shut before he could manage that. So then he thought of a dodge. It really seems as if nothing but *reason* could have prompted it. He pulled the gate back as far as he could, and following close upon it as it swung through of course found an exit the other side, and so departed.

Now I cannot myself account for this in any other way than that the dog must have had some power very similar to reason given it, for how could he have known that by bringing it back a long way it would swing through and leave an opening for him the other side? It almost seems as if he thought

Another case of similar powers of instinct in another animal is mentioned in Mr. Jesse's 'Gleanings in Natural History.' He says a clergyman living in the south-east of England had placed a pot of honey away in a closet which had recently been built, and in which some of the plaster rubbish still remained. Some months afterwards he went into this closet to fetch the honey, and was surprised to find a mound of rubbish heaped up against the side of the pot reaching nearly to the top. He did not at first move it, as he was desirous to ascertain what could have caused it, as he knew the closet had been kept locked. So he set a trap and caught a *mouse* which proved to be the culprit. Upon examining the pot he found that the honey had been raised very nearly to the brim by means of throwing in it pieces of rubbish of the same material as the mound, and with which it was nearly half filled. This wonderful fact reminds one rather of the fable by Æsop of the crow which managed to drink out of the vessel by dropping stones into it till the water came to the top, the only difference being that one is a fable, the other an undoubted fact.

The *Language* of animals is another point which we will examine next, and here of course it is very difficult to find out for certain how animals do communicate their wants and wishes to each other. The lower orders of creatures, particularly insects, communicate by signs, and the organs employed for that purpose are the feelers (antennæ) as in bees and ants, all of which like every other animal living in society require a medium of communication.

It is clear that bees use their antennæ as organs of communication, as Mr. Huber tried various experiments by amputating them altogether, and the results were curious. The queen bee ran about the combs, dropped her eggs anywhere, and became quite helpless: the workers neglected their labours, ran into corners, or some sunny spot, and soon quitted the hive for ever. The sentinels too of the beehive on a moonlight night may be seen patrolling round their habitation with these feelers stuck out, and if some wretched moth, which is endeavouring to steal into their habitation, come in contact with them, the signal is made and a body of guards rush out to punish the interloper.

Ants seem too to recognize each other after long absence. Mr. Huber once took an ant-hill from the woods, and put it in a glass hive, and finding he had too many ants he let some escape, and these found a nest in the garden. He then took the glass hive and its contents into his study and observed their habits for 4 months, when he put the hive in the garden, a few paces off the natural nest. Immediately the ants in it recognized their former associates, from whom they had been separated for so long a time; they caressed them with their antennæ, and (a strong proof of their affection) took them up in their mandibles and carried them to their own nest.

We remember the story of Dr. Franklin hanging his jar of treacle in his closet from a string fastened to the ceiling. However one ant happened to be left in the pot, and it crawled up the string and along the wall to its nest. In less than half an hour a whole army of ants sallied forth from their hole, down the string, and devoured all the treacle. This new mode of reaching the treacle must have been communicated by the first ant to all the others, so they clearly have some means of communication. We know well that frequently dogs, when their masters have met with some mishap will run home and by whining, scratching, and jumping on people will try to draw them on to follow it to the place where its master lies.

A curious incident is related by Mr. Thompson, as having occurred at Gibraltar, which is the only place in Europe where monkeys exist in a wild state, which the observer describes as a 'monkey court.' He saw a troop of monkeys brnging in an old grey-headed baboon as a prisoner. He says they arrived, halted, and detached their prisoner to a small distance, where he remained between two monkeys, who had the charge of him. The rest formed a sort of court, before which an advocate evidently accused the prisoner of some offence, while the prisoner kept on weeping, screaming, and frequently interrupting the attorney-general. Indeed the proceedings seem to have been rather singular, as judges, advocate, and prisoner were all screaming together. At length an old monkey screamed louder than the rest, and the prisoner was instantly hurried off and precipitated over a projecting rock. The soldiers who were looking on (one of whom relates this incident) were much scandalized by this proceeding, being convinced that old baboon was sacrificed under some false accusation to prevent his being burdensome to the parish.

I might go on further, and relate stories of other animals communicating their wishes to each other and also to mankind; but I think I need hardly do so, as we all know that the hen is understood by the chickens, the duck by her ducklings, the cat by the kittens, &c., and that such probably is the same with all creatures.

Another trait in the character of most animals is *gratitude.* A surgeon at Dover, seeing a terrier dog in the street, which had received some injury took it home and having cured it in a couple of days let it go, and for many weeks the animal used to pay him a daily visit of a few minutes, and after a vehement wagging of his tail, scampered off again to his own home. Examples of this kind might be multiplied, and we also know of many touching instances of mutual fidelity and attachment in animals towards each other, particularly if they have been long associates. Rats, parrots, cranes, ostriches, hares, dogs, and even lions have been known to evince most unmistakeable marks of affection towards their benefactors.

I think now I have said almost enough to convince you that inferior creation is endowed with wonderful powers and instincts, all of which shew us the marvellous beauty of the mechanism and examples of nature. I think I cannot do better than conclude with a remarkable instance of the domestication of the seal, mixed up with a dreadful tale of Irish superstition, which is related in the "Wild Sports of the West."

About 40 years ago a young seal was taken in Coen bay and domesticated in the house of a gentleman, who lived on the sea shore. It grew apace and became familiar with the servants and attached to the house and family; it was quite gentle, played with the children, came at its master's call, and was as the old men expressed it, as fond as a dog and as playful as a kitten. The seal used to go fishing daily, and after providing for his own wants, frequently brought home a salmon or turbot to his master. He had been 4 years thus domesticated, when a fatal disease called 'the crippawn' attacked some black cattle belonging to the master of the house; some died, others became infected, and the customary cure produced by changing them to other pasture failed. A wise woman was consulted and the hag assured the credulous owner that the mortality among his cows was occasioned by his retaining an unclean beast about his habitation—the harmless and amusing seal. He was told to send the seal away or the disease would continue. The superstitious wretch consented to the hag's proposal; the seal was put in a boat and carried out to sea and there left to shift for himself. The boat returned—the family retired to rest—and next morning the servant awoke her master to tell him the seal was sleeping in its usual place—the oven. Next morning a cow was reported to be unwell; the seal must be finally removed. A Galway fishing boat was leaving Westport on her return journey, and the master agreed to take the seal and not put him overboard till he had got some leagues off. It was done, a night and day passed, the second evening came, the servant was raking the fire for the night when something scratched at the house door. She expected it was of course the house dog. She opened it and in came the

seal, which with expressions of pleasure stretched itself before the fire and went to sleep. The master of the house was of course informed, and the old dame was consulted at once. She suggested that the animal should be deprived of sight, and then carried out to sea a third time, as it was unlucky to kill a seal. This hellish proposition was consented to, and the affectionate and confiding creature was cruelly robbed of sight and again, writhing in agony, was committed to the sea. A week passed and things became worse instead of better, the cattle died and the old hag at last gave out that her power was useless. On the eighth night after the seal had gone, a great storm of wind came on, in the pausing of the storm a wailing noise was faintly heard at times at the door. The servants, who slept in the kitchen, concluded that the Banshee had come to warn them of an approaching death, and buried their heads in the bed clothes; when morning broke the door was opened, and the seal was found lying dead upon the threshold. The emaciated skeleton of the poor animal was buried in a sand hill, and from that moment misfortunes followed the perpetrator and abettors of the horrible deed. The old hag was within 12 months hanged for the murder of her own grandchildren. Everything about the devoted house melted away, the sheep rotted, cattle died, corn was blighted, of several children none came to maturity, and the savage proprietor survived everything he loved and cared for. He died *blind* and miserable. There is not a stone of that accursed building standing on another. The property has passed to a family of a different name; and the series of incessant calamities which pursued all concerned in this cruel deed is as romantic as it is true.

Such is this story, and it really seems as if a judgment came upon this house in return for their so cruelly ill-treating this affectionate creature.

In concluding my paper this evening, I may add, that we have thus seen that nearly every animal which treads or crawls upon this earth, the fishes and other creatures which live in the sea, all have instincts and powers as wonderful as they are manifest, and I hope in future we shall be careful of the lives of creatures which do us no harm, but which if we examine them will afford us a vast amount of pleasure combined with profit, and also willing and anxious to impart to others the same feelings of humanity; and well may we all say with Adam—

> "These are thy glorious works, Parent of good,
> Almighty, this Thy universal frame,
> So wondrous fair."

There were 70 persons present—2 hon. members, 21 members, and 47 visitors.

MEETING HELD MAY 15TH, 1868.

THE following donations were announced and thanks ordered to be given to the donors :—

A large collection of Birds' Eggs by H. C. Mercer, Esq.

"Geology for the Million," by — Strickland.

"Coin Collectors' Manual," 2 vols., by G. G. Monck.

Archæology.—G. G. Monk, exhibited silver 1d., 1½d., 2d. pieces, and various other coins.

Ornithology.—E. im Thurn passed round a long list of notices obtained since April 1st, and exhibited the Italian variety of the Common Quail (Coturnix vulgaris), the only recorded instance of its occurring in England. It was picked up dead on the high road near Rockley, and differs from the ordinary Quail in having a *black* throat.

Botany.—The President exhibited a Cotton Plant from Egypt, some curious prickly leaves, and the flower of a species of *Datura*, from Bazil, and a specimen of the Hen-and-Chicken Daisy.

Geology.—E. Almack exhibited a specimen of *Nautilus Elegans.*

There were also exhibited the skull of a Donkey, and bone with the earthy matter removed, by the President, and Spanish and Caucasian Daggers by E. S. Preston.

The old Editing Committee were re-elected, and C. F. Harrison, T.W. Harvey, W.D.Fenning, L. C. Calley, and A. D. B. Hovell were elected members.

G. H. Holden then read a paper on Rats.

After the paper an animated discussion took place in connection with the subject.

There were 70 persons present—4 hon. members, 19 members, and 47 visitors.

MEETING HELD MAY 20TH, 1868.

THIS was a special meeting held for the purpose of exhibiting objects obtained during the whole holiday.

The following were exhibited by E. im Thurn :—Ivy-leaved Crowfoot *(R. hederaceus)*, Caper Spurge *(E. Lathyris)*, Water-violet *(Hottonia palustris)*

and Cotton-grass (*Eriophorum*), gathered near Reading by F. J. H. Jenkinson; also a variety of the lady fern (*A. Filix-fœmina*) Clematis, Mountain Avens (*Geum Montanum*) *Hoya carnosa*, *Vinca alba*, Service Tree (*Pyrus domestica*), *Liatris spicata*, &c.; also a nest and eggs of the Nightingale (*Pilomela luscinia*) taken on the 29th by F. J. H. Jenkinson, near Reading, and a nest and pair of birds of the Dartford Warbler (*Melizophilus Dartfordiensis*); he also mentioned the fact of a rat having entered into a large pot of *Maidenhair Fern* by a hole in the side. It had then eaten a large portion of the roots, and when discovered, had a litter of young ones in the hole thus formed.

There were also exhibited Eggs of the Stone Curlew, from Overton Downs, by G. Holden; claws of Lion and Leopard, from India, also by G. Holden; skin of Common Snake, and larva with Ichneumons, by R. M. B. Glasse; Fibrous Iron Ore and other Minerals by W. Greg.

MEETING HELD MAY 29TH, 1868.

The following objects were exhibited:—

Geology.—The following fossils from the Lower Chalk at Bignal:—*Ammonites Giganteus*, *A. Varians*, *A. Mantellii*, *Turrilites Costatus*, and *Inoceramus Cuvieri*, by E. Almack.

Archæology.—Coins of the reigns of Henry IV., Edward IV., Elizabeth, &c., presented to the Museum by G. G. Monck and E. C. Sewell.

Ornithology.—A male egg of the Ostrich by the President.

Botany.—Specimens of *Marchantia polymorpha* (exhibiting fructification), *Cephalanthera Grandiflora* (found by E. im Thurn in Rabley Copse), monstrosity of Garden Anemone, and *Chætophora Elegans* (a Conferva), some of which was also exhibited under the microscope, by the President.

Zoology.—Peculiar species of Slug by the President, and a small Sun fish by H. Manders.

The President then read a paper on the Common Dandelion (*Leontodon Taraxacum*), illustrated by diagrams and specimens.

H. J. Verrall and E. L. Hesketh were elected ordinary members.

There were 64 persons present—2 hon members, 22 members, and 40 visitors.

MEETING HELD JUNE 12TH, 1868.

EXHIBITIONS.

Geology.—Grey wethers with marks of rain and stained by iron, by E. Almack, who also gave a summary of the work of the section during the half year.

Archæology.—The collection of Roman Coins belonging to the society by G. G. Monck.

Entomology.—F. Jenkinson gave his report.

A nest of wild bees destroyed on the larvæ of *A. Colonella*, by the President.

Ornithology.—A specimen of Wryneck (*Yunx Torquilla*), by E. im Thurn, who also announced that he had presented his extensive collection of bird's nests to the Society.

Specimens of Blue Wren, Leatherhead, and Green Pigeon from Australia, by G. Holden.

A pair of Pied Wagtails (*Motacilla Yarrellii*) and nest presented to the Society by W. J. Pratt.

Botany.—Specimens of "Job's Tears," the seed *Coix Lacryma* from Jamaica, by the President.

Fossilised Oak from Shropshire, by E. C. Sewell.

There were also exhibited an American Snake, and Peacock Copper Ore from Cornwall, by E. C. Sewell; and Lava from Vesuvius, with the cavities filled with Carbonate of Lime, and specimens of fossilised wood, by W. Greg.

W. Fergus, Esq., M.D., then gave a lecture, illustrated by numerous diagrams, on "The Organ and Sense of Smell."

S. Image was elected Secretary, and G. E. Manisty member of the Committee for the coming half-year.

There were 77 persons present—2 hon. members, 28 members, and 47 visitors.

CORRESPONDENCE.

In order to secure a more lively interest in the welfare of the Society amongst the members after they have left the School, it has been decided to institute a number of "Corresponding Members," who are invited to make notes upon the Natural History of the country in which they are residing, and to forward the same to be read at the meetings of the Society, and to be published in the Half-yearly Report. The following "Notes" were supplied for that purpose by F. Bonney, who, though not an old member of the Society, would certainly have been among its Members had the Society been in existence whilst he was at the School.

FOREIGN CORRESPONDENCE.

MOUNT MURCHISON, RIVER DARLING, AUSTRALIA,
SEPT., 1866.

I expect you will like to hear something of the natural history of this strange country, so I will endeavour to give you some information in this letter. When I came here the country was parched and dry, but in January last the drought of nearly two years was broken by the fall of much rain. After that vegetation was renewed and everything flourished; birds, reptiles, and insects, are now plentiful although scarce before the rain; but Australia is I think rather destitute of animal life. In this district (long. 143, E. lat. 31° S.) the kangaroo is not plentiful or generally distributed, but in some few places in the back country, *i.e.* back from the river it is common. Emus, in a good season like the present one, are frequently to be seen, they have lately been breeding and their eggs have often been found in the back country. The emu builds no nest, but lays its eggs, sometimes as many as eleven in number, on the bare ground, and frequently away from any bush or shelter. The spot chosen by the bird is a sandhill, not far from a waterhole of some kind, so that by following the tracks from about the waterhole on to the sandhills, their eggs are usually found; they are valuable in this country, as silversmiths mount them handsomely in silver to form cups of different kinds. I have obtained two beauties, and hope shortly to procure more. The egg is about 5½ inches long and 3½ in diameter; colour, dark green, with a rough surface. The black swan is also common on the small lakes in this neighbourhood, the egg is of the same colour as that of the white swan but smaller; they trample down the middle of a small close-growing bush, and lay their eggs, sometimes as many as twelve, in the hollow thus formed. I have some of their eggs and also a young swan, which I hope to rear, for it is very tame and doing well. I had a pair of them given me but the carrion crows robbed me of one. Crows and hawks abound here; the former are more destructive than the latter; it is the real carrion crow. The pelican is common on the rivers and lakes, but the eggs I have not seen as they are seldom found. Both the white and the black species of cockatoo are very plentiful, they fly about in large flocks,

feeding on the plains, and roosting in the gum trees by the river. The black cockatoo you probably have not seen, for it is not met with in many parts. It is black all over excepting in the tail, the feathers of which are black and red. It is a very savage bird and has a far more powerful bill than the white species. The native names are—black cockatoo, *Day yarru*: White cockatoo, *Kaiuke*. There are great numbers of several small green kinds of Parroquets.

There are not, I think, many kinds of butterflies here, but a great many moths, some of which are very large.

MOUNT MURCHISON, RIVER DARLING,
MARCH 18TH, 1867.

The gum tree I think makes the country where it grows look pretty. In growth it resembles the English oak, more than any other tree I know; it grows to a great size sometimes, having a gigantic trunk; generally the timber is large as I believe I have already told you: it only grows near rivers and watercourses. On account of the line of these trees on each bank, the "river timber" as we call it, is visible a great distance off. It can always be distinguished from other timber by its blueish appearance, size, and regularity, for there is seldom a break in it about here. I have seen the river timber 10 miles distant from me, that is, over country that is tolerably level. From a high spot it is visible at a great distance, for the atmosphere here is very clear excepting in the middle of the day in warm weather, when the distance is hazy and generally hidden by the mirage.

The colour of the bark of the gum tree, I think adds greatly to its beauty. If I remember rightly it is something like the bark of the beech tree, of various colours, white near the upper part of the tree, with a pink or greenish tinge, reddish brown, &c., and scales off in thin coats, from the surface. The bark is used by us to roof our buildings and by the natives for making canoes, who can strip it off very swiftly in the proper season. Farther back from the river, away from its banks, and on ground that is occasionally flooded, the box tree grows, it is very similar to the yew, but does not grow to such a size; its flower has a very sweet smell, which on a still evening scents the air very pleasantly.

From the gum tree there falls sometimes in small drops or attached to strips of the bark, a kind of gum which is very good eating, sweet, and has a

most pleasant flavour. It would be much valued by "lolly makers" at home, I think, for in its natural state it is nearly equal in goodness (I think I may say) to *Webb's choicest* kind. About six weeks ago the blacks were gathering a good deal of it on the banks of the river. I do not think the growth of the tree at all stiff. Our vegetation is not white, only the salt bush and cotton bush. These are both rather white. There are several kinds of salt bush, the large kind or "old man salt bush," grows often to a height of 4 feet, stock are not as fond of this as they are of the smaller kinds, which are fattening, as is also the cotton bush.

There are several kinds of parasites about here. I have specimens of six different kinds; the leaves of some are very similar to those of the English mistletoe, they all flower very freely and the flowers are very pretty.

MOUNT MURCHISON, RIVER DARLING,
MARCH 1ST, 1868.

In this district we have very good water, pure and clear, but in some other parts close by the water is either thick or salt. The water we generally obtain in wells is salt, very often so much so as to be useless for stock or other purposes. We may consider ourselves lucky for out of five wells sunk we have fresh and good water in two of them. The others are useless; our neighbours have not been so successful in their attempts to secure permanent water. Well sinking is very expensive work, as we seldom get a good supply of water in less than 100 feet sinking, and then after all the chances are that the water in the wells will be useless. Wells are a standby for a drought; at present we have not had to use ours. There are a number of creeks with some deep water holes in them which will keep water in them for twelve months after being filled; some last eighteen months. It is only in exceptional seasons such as the drought in 1865, that the creeks dry up; that drought continued for over 18 months, but then we had a large lake filled by a flood from the river for the stock, besides a small quantity of water in the creeks. Since that time we have had occasional rains, keeping water in the creeks. Three weeks ago I thought we were going to have another drought, but a nice rain fell just in time, so now (autumn) the country will be green and fresh all the winter. Grass and herbage grow very quickly here after rains. The ground is like a hot bed, especially on the sand hills, so that you can almost see the grass grow. Now the country looks very nice and pretty, every-

thing flourishing, and the Mulga scrub covered with yellow blossoms. This is a nice country and a beautiful climate in the winter season, but in summer it is too much like an oven, with the thermometer sometimes up to 115° in shade, and hot winds blowing and every thing dry, besides the annoyance of flies and mosquitoes innumerable. This past season has been too dry for many of the latter, but now since the green grass has sprung up they have appeared; the cold weather, however, will soon make them retire. If you were here now you could make a fine collection of moths and all kinds of insects, for there are numbers of various kinds flying about the lamp while I write this. Bats, moths, beetles, mosquitoes, gnats and small insects; occasionally a *Galii* makes its appearance, I think it must be common here for I have seen several specimens. There are also some most curiously shaped insects; I should like you to see a long wiry insect, about six inches long, which I secured the other night,—it looks like a cross between a grasshopper and "a daddy long legs." It has long legs but no jumpers, small wings, coloured the same as parts of its long body, rose green and white, he would be a curiosity at home but he is too large to send conveniently, and has got damaged through my not having a good box to put him in. A smaller kind of a similar species is common and appears like the dead twig of a bush as it crawls steadily along: the blacks (natives) say that when they come about there will be windy weather, so call them *yertu amucca* (wind mother).

ENTOMOLOGY.

In this department, considering the absence of many of its members, a good deal of work has been done. Several new species have been taken, and many old ones more abundantly than hitherto.

Those narked H are hybernated specimens.

Those marked * are new to the place.

Names of those whose initials occur in the following list.

A.W.B.	A. W. Banks.
C.S.B.	C. S. Beesley, Esq.
F.J.C.B.	F. J. C. Boles.
G.G.B.	Rev. G. G. Bradley.
F.J.B.	Rev. J. F. Bright.
C.M.B.	C. M. Bull, Esq.
S.M.C.	S. M. Chapman.
L.C.	L. Chapman.
S.F.C.	S. F. Chichester.
W.H.C.	W. H. Churchill.
J.G.C.	J. G. Crosse.
E.H.D.(a)	E. H. Davis, I.
E.H.D.(b)	E. H. Davis, II.
G.H.D.	G. H. Dawson.
J.B.F.	J. B. Fuller.
H.G.	H. Glasse.
B.J.G.	B. J. Guillemard.
J.H.	J. Hamilton.
E.L.H.	E. L. Hesketh.
E.im T.	E. im Thurn.
F.J.H.J	F. J. H. Jenkinson.
H.A.J.	H. A. Johnson.
M.J.K.	M. J. Knubley.
D.E.L.	D. E. Leighton.
W.H.M	W. H. Macdonald, Esq.
P.T.M.	P. T. Macquoid.
H.M.	H. Manders.
G.M.	G. Manisty.
W.M.	W. Mansell, Esq.
G.C.M	G. C. Mansel.
C.M...	C. Marrett.
S.M.	S. Morse.
J.B.O.	J. B. Oakeley.

E.P.	E. Peters.
W.G.P	W. G. Phillimore.
W.J.P.	W. J. Pratt.
E.S.P.	E. S. Preston.
T.A.P.	Rev. T. A. Preston.
C.A.S.	C. A. Sladen.
M.H.S	M. H. Smith.
S.D.S.	S. D. Smith.
J.S.	Rev. J. Sowerby.
G.T.S	G. T. Spencer.
F.S.	F. Storr, Esq.,
H.C.W.	H. C. Warren.
G.A.W..	G. A. Wright.

RHOPALOCERA.

Name.	*Date.*	*Captor.*
Gonepteryx Rhamni ...	H Feb. 14—Mar. 14	H.M.—C.S.B.
Pieris Brassicæ	Mar. 31	C.A.S.—S.M.C.
P. Rapæ	Mar. 12 & 14 ...	J.S.—C.M.B.
P. Napi	seen Mar. 4	M.H.S.
Anthocharis Cardamines	seen April 26	J.H.
	taken May 6	H.M.—L.C.—E.H.D.(b)
Lasiommata Ægeria	May 6	F.J.H.J.
L. Megæra	May 9	J.S.
Hipparchia Janira	June 2	B.J.G.
Cœnonympha Pamphilus ...	May 7	J.B.F.—E.L.H.
Cynthia Cardui	May 28	J.B.F.
Vanessa Atalanta	May 6	F.J.H.J.
V. Io	H Mar. 15	C.A.S.
V. Urticæ	H Feb. 11, 15, 20 ...	J.S.—G.G.B.—J.F.B.
V. Polychloros	H April 18	C.A.S.
Argynnis Selene	May 19...	H.C.W.
A. Euphrosyne	May 9	F.S.
Nemeobius Lucina...	May 20...	G.T.S.
Chrysophanus Phlœas	May 19...	S.D.S.
Polyommatus Alsus	May 27...	F.J.H.J.—F.J.C.B.&J.B.F. E.L.H.
P. Alexis	May 18...	H.M.
P. Agestis	May 19...	J.B.F.—H.C.W.—F.S.
Thymele Alveolus	May 6	J.B.F.—E.L.H.
Thanaos Tages	,, ...	

Name.	*Date.*	*Captor.*
Pamphila Sylvanus	May 22...	J.B.F.
HETEROCERA		
SPHINGINA.		
Procris Statices	May 27...	E.L.H.
Anthrocera Filipendulæ ...	June 18	F.J.H.J.
Smerinthus Ocellatus	June 12	D.E.L.
Sphinx Ligustri	June 6	W H.M.
Chærocampa Elpenor	June 6	W.H.M.
C. Porcellus	June 1	G T.S.
Macroglossa Stellatarum	seen Mar. 6	E.im T.
„	taken May 14	G.M.—F.S.
Sesia Fuciformis	June 14	C.M.B.—F.S.
BOMBYCINA.		
Hepialus Humuli	June 12	G.A.W.
Cossus Ligniperda ...	20 larvæ Mar. 6	J.B.F.
Diloba Coeraleocephala ...	larvæ May 16	F.J.C.B.
Pygæra Bucephala...	... larvæ May 11	W.H.C.
Dasychira Pudibunda	May 12	E. im T.
Porthesia Auriflua ...	... larvæ May —	F.J.C.B.
Gnophria Rubricollis	June 8	J.B.F.
Nudaria Mundana	June 18	C.M.
Arctia Caja	larva April 9...	J.G.C.
Nemeophila Plantaginis ...	May 20	F.S.
Spilosoma Menthastri	May 13	E.H.D.(a)
S. Lubricepeda	May 23	J.B.F.
Diaphora Mendica	May 18	E.imT.
Callimorpha Jacobææ	May 16	T.A.P.
Odonestis Potatoria ...	larva April 17	F.J.C.B.
Cilix Spinula	May 20	W.M.
Platypteryx Lacertinaria ...	May 15	G.C.M.
NOCTIUINA.		
Briophila Perla	June 14	F.J.H.J.
Acronycta Psi...	June 8	F.J.C.B.
Xylophasia Lithoxylea	June 17	F.J.H.J.
X. Polyodon	June 13	E.P.
Mamestra Brassicæ	May 29...	F.J.H.J.
Apamea Basilinea	June 4	
Miana Strigilis	June 3	F.J.C.B.
Grammesia Trilinea	May 18	W.G.P.

Name.	*Date.*	*Captor.*
Caradrina Cubicularis	June 19	F.J.H.J.
Agrotis Exclamationis	June 2	F.J.H.J.
Triphœna Pronuba...	June 11	H.G.
Noctua C.-nigrum	May 28	F.J.H.J.
Tæniocampa Gothica	Mar. 22	T.A.P.
Scopelosoma Satellitia	H. Feb. 29	E.S.P.
Phlogophora Meticulosa ...	Apr. 26	P.T.M.
Hadena Dentina	June 7	F.J.C.B.
H. Oleracea	May 18	F.S.
Cucullia Umbratica	June 1	S.M.
Plusia Chrysitis		
P. Iota	May 25...	
P. Gamma	May 21...	H.C.W.
Gonoptera Libatrix ...	H Mar. 14	S.F.C.
Euclidia Mi	May 11	J.B.F.
E. Glyphica	May 19	F.S.
Phytometra Ænea...	May 8	F.J.H.J.
	GEOMETRINA.	
Rumia Cratægata	April 17	G.C.M.
Eurymene Dolobraria ...	seen June 2	F.J.H.J.
Selenia Illunaria	Mar. 15	T.A.P.
Odontopera Bidentata	May 15...	G.M.
Amphidasis Prodromaria ...	Mar. 22	H.A.J.
A. Betularia	April 26	M.J.K.
Hemerophila Abruptaria ...	May 9	J.B.F.—B.J.G.
*Cleora Lichearia	June 17	F.J.H.J.
Iodis Lactearia	May 13...	H.M.
*Ephyra Trilinearia	May 6	F.J.H.J.
Asthena Candidata	May 13...	F.J.H.J.
A. Luteata	June 3	J.B.F.
Acidalia Scutulata...	May 27...	F.J.H.J.
A. Virgularia	June 18	F.J.H.J.
A. Aversata	June 22	F.J.H.J.
Cabera Pusaria	May 6	G.C.M.
C. Exanthemata	June 2	F.J.H.J.
Corycia Punctata	May 29...	F.J.H.J.
C. Taminata	May 8	J.B.F.
Strenia Clathrata	May 6	J.B.F.—E.L.H.
Lozogramma Petraria	May 7	H.M.

Name.	*Date.*	*Captor.*
Minoa Euphorbiata	May 21...	F.J.H.J.—J.B.F.
Ligdia Adustata	June 10	C.A.S.
Lomaspilis Marginata	June 2	F.J.H.J.—F.J.C.B.
Hybernia Rupicapraria...	about Feb. 17...	
H. Leucophearia	Mar. 2	J.B.O.
H. Progemmaria	Mar. 22	E.im T.
Larentia Miaria	May 13...	G.C.M.
Emmelesia Blandiata	May 29...	F.J.H.J.
Eupithecia Pumilata	April 13	J.B.F.
E. Rectangulata	June 16	F.J.H.J.
Melanthia Ocellata	May 13...	G.C.M.
Melanippe Biriviata	May 6	F.J.H.J.
M. Montanata...	May 16...	H.M.
M. Fluctuata	April 20	W.J.P.
Coremia Propugnata	May 28...	C.A.S.
C. Ferrugaria	May 2	G.C.M.
Camptogramma Bilineata ...	May 29...	P.T.M.
Scotosia Dubitata	May 8	G.M.
Cidaria Corylata	May 21...	F.J.H.J.—J.B.F.
C. Russata	May 18...	F.J.H.J.
*C. Suffumata...	April 29	F.J.H.J.
Eubolia Plumbaria...	June 2	C.A.S.
C. Lineolata	May 14...	C.A.S.
Odezia Chœrophyllata	June 1	
	PYRALIDINA.	
Hypena Proboscidalis	June 3	J.B.F.
*Herminia Barbalis	May 27...	F.J.C.B.—F.J.H.J.
Herbula Cespitalis...	May 3	F.J.H.J.
Hydrocampa Nymhæata ...	June 2	J.B.F.
Botys Verticalis	June 5	C.A.S.
B. Fuscalis	May 28...	F.J.H.J.
B. Urticata		
*Ebulea crocealis	May 6	F.J.H.J.
E. Sambucalis...	May 27...	C.A.S.
Pionea Forficalis	May 16...	T.A.P.
Scopula Olivalis	May 28...	F.J.H.J.
Simaethis Fabriciana	May 4	F.J.H.J.
Aphomia Colonella ...	bred June 11, by... ...	T.A.P.
Crambus Pratellus	May 20...	F.J.C.B.

Name.	*Date.*	*Captor.*
Chloephora Prasinana	May 27...	F.J.H.J.
*Chimabacche fagella	Apr. 1	A.W.B. & G.C.M.
Œcophora sulphurella	May 13...	G.M.
PTEROPHORINA.		
Pterophorus Microdactylus ...	May 27...	F.J.H.J.
P. Galactodactylus	June 14, (bred) ...	F.J.H.J.
P. Pentadactylus	June 14...	G.H.D.

BOTANICAL NOTICES.

THE following list, which is unusually long this year, will show a very satisfactory amount of work done. It must be remembered that, though only a few names of observers are recorded, a very much larger number might be added of those who have not been so fortunate as their companions in bringing plants just in flower. Taking this into consideration, it may be safely stated that Botany was never more successfully cultivated at Marlborough College than during the past half-year. In consequence of the institution of Field-days, and the enrolment among our ranks of several Masters, it has been thought desirable to enlarge the area marked out in the "Flora of Marlborough." In this way a few additional plants have been added to the list.

As usual "By" indicates that a plant has been apparently in flower a day or two before being discovered, and an asterisk (*) that the specimen observed was a cultivated one.

Names of those whose initials appear in the following list:—

M. O. A. ... ... M. O. Alison.
E. A. ... ... E. Almack.
W. S. B. ... ... W. S. Bambridge, Esq.
A. W. B. ... ... A. W. Banks.
R. H. B. ... ... R. H. Bicknell.
E. F. B. ... ... E. F. Blosse.
H. E. B. ... ... Rev. H. E. Booth.
R. H. B. ... ... R. H. Bulley.
L. C. C. ... . L. C. Calley.
H. D. ... ... H. Dalton.

T. L. D. ... ... T. L. Davies.
G. H. D. ... ... G. H. Dawson.
G. W. D. L. ... ... Rev. G. W. De Lisle.
T. W. D. ... ... Rev. T. W. Dowding.
J. W. D. ... ... J. W. Dudding.
T. M. E. ... ... T. M. Edgworth.
H. A. E. ... ... H. A. Evans, Esq.
J. B. F. ... ... J. B. Fuller.
R. M. B. G. ... ... R. M. B. Glasse.
B. J. G. ... ... B. J. Guillemard.
C. F. H. ... ... C. F. Harrison.
E. L. H. ... ... E. L. Hesketh.
H. ... ... Hewson.
A. C. H. ... ... A. C. Hilton.
H. M. H. ... ... H. M. Hilton.
J. W. H. ... ... J. W. Hockin.
G. H. ... ... G. Holden.
S. I. ... ... S. Image.
F. J. H. J. ... ... F. J. H. Jenkinson.
G. A. L. ... ... G. A. Lefroy.
J. A. L. ... ... J. A. Lefroy.
H. L. ... ... H. Lopes.
W. H. M. ... ... W. H. Macdonald, Esq.
T. E. M. ... ... T. E. Maclean.
P. T. M. ... ... P. T. Macquoid.
G. C. M. ... ... G. C. Mansel.
J. W. M. ... ... J. W. Mills, Esq.
J. B. O. ... ... J. B. Oakeley.
H. E. P. ... ... H. E. Passy.
R. P. ... . R. Phayre.
J. S. P. ... ... J. S. Pratt.
E. S. P. ... ... E. S. Preston.
T. A. P. ... ... Rev. T. A. Preston.
B. W. R. ... ... B. W. Repton.
A. R. ... ... A. Reynardson.
S. A. R. ... ... S. A. Rogers.
E. E. S. ... ... E. E. Shearburn.
J. S. ... ... Rev. J. Sowerby.
S. S. ... ... S. Spencer.
H. C. S. ... ... H. C. Spry.

F. S. ... ... F. Storr, Esq.
C. W. T. ... ... Rev. C. W. Tayler.
E. im T. ... ... E. im Thurn.
T. T. ... ... T. Tilleard.
E. J. T. ... ... E. J. Turner, Esq.
E. H. W. ... ... E. H. Wayman.
G. W. W. ... ... G. W. Wootten.
W. W. ... ... W. Willimott.
P. G. Y. ... ... P. G. Young.

Thalictrum—
* majus ... ... May 26, E. im T.
flavum ... ... Meadow Rue ... ... Bud, June 2, J. S.
Anemone—
nemorosa ... ... Wood Anemone ... ... March 2, H. D.
* apennina ... Blue Anemone ... ... March 14, H. E. B.
* pulsatilla ... Pasque Flower ... ... April 22, T. A. P.
Hepatica—
* triloba ... ... Hepatica... ... ... By Feb. 13, E. im T.
Adonis—
* autumnalis ... Pheasant's Eye ... ... April 10, E. im T.
Myosurus—
minimus... ... Mouse-tail ... ... Full fl. May 19, T. A. P.
Ranunculus—
heterophyllus ... Water Crowfoot ... ... Lockeridge, Apr. 4, T. A. P.
Marlborough, Ap. 14, T. A. P.
peltatus ... ... Ditto ... ... April 10, F. S.
hederaceus ... Ivy-leaved Crowfoot ... Full fl., Pewsey, May 19, J. S.
Flammula ... Spear-wort ... ... Reading, May 19, F. J. H. J.
Ficaria ... ... Lesser Celandine ... ... Feb. 15, H. M. H.
auricomus ... Goldilocks ... ... March 29, E. S. P.
acris .. .. Upright Crowfoot ... ... April 5, J. S.
repens ... ... Creeping Crowfoot ... April 23, H. C. S.
bulbosus ... ... Buttercup ... ... April 9, E. im T.
arvensis ... ... Corn Crowfoot ... ... May 15, J. S.
Caltha—
palustris ... ... Marsh Marigold ... .. March 23, E. im T.
Trollius—
* europæus ... Globe Flower... ... ... May 5, H. E. B.

Eranthis—		
* hyemalis ...	Winter Aconite	About Feb. 1,
Helleborus—		
viridis	Green Hellebore	March 4, M. O. A.
Aquilegia—		
vulgaris	Columbine	May 4.
Berberis—		
vulgaris	Berberry	By May 5, T. A. P.
* fascicularis ...	... ...	March 13, E. J. T.
Papaver—		
Rhœas	Common Poppy	May 19, H.
dubium	Long-headed Poppy ...	May 26, E. J. T. & F. S.
* orientale ...	... ...	June 2, E. im T.
Meconopsis—		
* cambrica ...	Yellow Poppy...	May 11, T. A. P.
Chelidonium—		
majus	Greater Celandine... ...	April 2, T. A. P.
Corydalis—		
* lutea	... ...	Full fl. May 10, J. S.
* solida	Solid Corydal	March 14, E. im T.
Fumaria—		
officinalis ...	Fumitory	May 11, F. S.
Cheiranthus—		
* Cheiri	Wallflower	April 1.
Nasturtium—		
palustre	... ...	Full fl. May 19, G. W. D. L.
sylvestre	... ...	Full fl. June 1, F. J. H. J.
officinale	Watercress	Bedwyn, May 19, T. A. P.
		Marlbro' May 27, E. im T.
Barbarea—		
vulgaris	Yellow Rocket.	May 1, J. S.
Arabis—		
hirsuta	Hairy Rock-cress	March 14, E. im T.; F. S.
Cardamine—		
hirsuta	Hairy Bitter-cress... ...	Feb. 13, E. im T.
pratensis	Cuckoo-flower	March 31, E. S. P.
Sisymbrium—		
officinale	Hedge-mustard	May 15, J. S.
thalianum ...	Thale-cress	June 3, T. A. P.
Alliaria—		
officinalis... ...	Garlick Hedge-mustard	April 14, T. A. P.

Brassica—		
campestris ...	Wild Navew	(Oare) April 4, F. S.
Lunaria—		
* biennis	Honesty	April 14, T. A. P.
Sinapis—		
arvensis	Charlock	April 2, H. M. H.
alba	... ...	fl. and seed, May 19, P.G.Y.
Draba—		
verna	Whitlow-grass	By March 14, E. J. T.
Armoracia—		
* rusticana ...	Horse-radish	(Pewsey) May 19, T. A. P.
Lepidium—		
campestre ...	Pepper-wort	April 8, E. im T.
Capsella—		
Bursa-pastoris ...	Shepherd's Purse	March 14, F. S.
Senebiera—		
coronopus	Swine's Cress	June 2, T. A. P.
Isatis—		
* tinctoria	Woad	May 3, T. A. P.
Reseda—		
lutea	Wild Mignonette	by June 10, H. M. H.
Helianthemum—		
vulgare	Rock-rose	May 9, T. A. P.
Viola—		
odorata	Sweet Violet	March 1, M. O. A.
hirta	Hairy Violet	March 15, E. im T.
sylvatica	Wood Violet	
(a) Reichenbachina	... ...	by March 30, H. M. H.
(b) Riviniana ...	... ...	March 28, H. A. E.
canina	Dog Violet	by May 17, T. A. P.
tricolor	Pansy	March 4, S. I.
(a) arvensis	Ditto	April 8, J. B. F.
* Pensylvanica ..	... ...	May 21, E. im T.
Polygala—		
vulgaris	Milkwort	April 23, H. C. S.
Dianthus—		
* cæsius	Cheddar Pink	full fl. May 23, E. im T.
Silene—		
inflata	Bladder Campion	May 20, F. S.
Lychnis—		
Flos-cuculi	Ragged Robin	May 19, G. W. D. L.

vespertina	White Campion	May 19, E. L. H. & J. B. F.
diurna	Red Campion	April 25, E. J. T.
Githago	Corn Cockle	June 10, F. S.
Sagina—		
procumbens ...	Pearl-wort	April 4, E. im T.
Arenaria—		
trinervis	Three-nerved Sandwort	April 4, T. A. P.
serpyllifolia ...	Thyme-leaved ditto ...	March 14, F. S.
Stellaria—		
media	Chickweed	by Feb. 13, E. im T.
Holostea	Greater Stitchwort ...	April 9, J. S.
graminea	Grassy Stitchwort... ...	May 31, E. im T.
uliginosa	Bog Stitchwort	May 19, T. A. P.
Cerastium—		
glomeratum . .	Mouse-ear Chickweed ...	April 3, F. S.
*arvense	Field Chickweed	May 6, T. A. P.
Malva—		
moschata	Musk Mallow...	June 21, E. im T.
sylvestris	Common Mallow	by May 31, T. A. P.
rotundifolia ...	Dwarf Mallow	May 13, F. S.
Tilia—		
*parvifolia	Lime Tree	leaf April 30
		fl. just out June 22, T. E. M.
Hypericum—		
hirsutum	Hairy St. John's Wort ...	June 19, F. S.
pulchrum	Upright St. John's Wort	June 19, F. S.
Acer—		
campestre	Field Maple	leaf April 7, T. A. P.
		fl. May 6, E. im T.
*Pseudo-platanus	Sycamore	leaf April 2, E. im T.
		fl. April 20, H. D.
Æsculus—		
*Hippocastanum	Horse Chestnut	leaf April 6, E. im T.
		fl. May 6, F. S.
*rubicunda ...	... ...	May 16, F. S.
Geranium—		
*Phæum	Dusky Crane's Bill ...	April 30, T. A. P.
*sylvaticum ...	Wood ditto	May 9, E. im T.
pratense	Meadow ditto...	May 19, E. L. H. & J. B. F.
*sanguineum ...	Bloody ditto	May 6, E. im T.
dissectum	Cut-leaved ditto	May 11, F. S.

columbinum ... Long-stalked ditto... ... June 3, F. S.
rotundifolium ... Round-leaved ditto ... May 6, T. A. P.
molle ... ... Dove's foot ... ... April 9, E. im T.
lucidum ... ... Shining Crane's Bill ... May 4, T. A. P.
robertianum ... Herb Robert ... ... May 8, E. J. T.
*striatum ... ... Pencil Geranium ... ... May 28, E. im T.

Linum—
catharticum ... Purging Flax ... ... May 16, F. S.
*montanum ... ... May 24, T. A. P.

Oxalis—
Acetosella ... .. Wood Sorrel ... ... March 22, T.M.E. & T.E.M.

Euonymus—
europæus ... ... Spindle ... ... leaf April 4, T.A.P.
fl. May 16, F.S.

Staphylea—
*pinnata ... ... Bladder-nut ... ... May 3, T.A.P.

Rhamnus—
catharticus... ... Buckthorn .. .. May 25, E. im T.

Ulex—
europæus ... ... Furze ... ... full March 3, E.A. & A.R.

Genista—
tinctoria ... ... Dyer's Green-weed ... full fl. June 1, F.J.H.J.
anglica ... ... Petty whin ... ... full (Newbury) May 19, F.S.

Sarothamnus—
scoparius ... ... Broom ... ... April 22, T.A.P.

Ononis—
arvensis ... ... Rest Harrow ... ... June 20, F.S.

Medicago—
lupulina ... .. Black Medick... ... ... April 18, E. im T.

Trifolium—
pratense ... ... Purple Clover... ... ... May 1, F.S.
repens... ... ... Dutch Clover ... ... May 19, T.A.P.
minus ... ... Lesser Hop Trefoil ... March 14, E. im T.
* incarnatum ... Scarlet Clover ... ... May 16, F.S.

Lotus—
corniculatus ... Bird's foot ... ... May 13, E. im T.

Anthyllis—
vulneraria ... ... Ladies' Fingers ... ... May 2, F.S.

Astragalus—
glycyphyllos ... Milk Vetch ... ... June 10, F.S.

Vicia—		
hirsuta...	Hairy Tare	May 13, F.S.
tetrasperma ...	Slender Tare	May 11, F.S.
sylvatica	Wood Vetch	June 3, E. im T.
Cracca	Tufted Vetch	June 8, T. A. P.
sepium	Bush Vetch	April 14, E. im T.
sativa(angustifolia)	Common Vetch	May 13, F. S.
* faba...	Broad Bean	May 11, F. S.
Lathyrus—		
pratensis	Everlasting Tare	May 16, E. J. T.
macrorrhizus ...	Tuberous Vetch	April 13, G. C. M. & A. W. B.
Hippocrepis—		
comosa	Horse-shoe Vetch	May 13, E. J. T.
Onobrychis—		
sativa	Cock's Head	May 13, F. S.
Cytisus—		
*Laburnum... ...	Laburnum	May 8, R. P.
Prunus—		
communis		
(a) spinosa... ...	Sloe...	March 29, B. W. R.
(b) insititia... ...	Bullace	leaf March 1, E. im T.
		fl. April 1, J.B.O. & S.A.R.
Avium...	Cherry Tree	leaf April 3, E. im T.
		fl. April 10, G. H. D.
Cerasus	Cherry	fl. Ap. 12, E.S.P.
*Padus	Bird-cherry	fl May 3, T.A.P.
*Lauro-cerasus ...	Laurel	Ap. 4 (Oare), F.S.
		Ap. 23 (Marlb.), T.A.P.
Spiræa—		
Ulmaria	Meadow-sweet	June 2, J.S.
*Filipendula ...	... ...	June 15, E. im T.
Sanguisorba—		
officinalis	Great Burnet...	May 13, (Savernake), E.im T.
		May 19, (Marlb.) G. W. W.
Poterium—		
Sanguisorba ...	Small Burnet...	Ap. 25, E.im T.
Agrimonia—		
Eupatoria	Agrimony	May 13, F.S.
Alchemilla—		
vulgaris	Lady's Mantle...	Ap. 29, F.S.

arvensis — ...	Parsley-piert	Ap. 4, T.A.P.
Sibbaldia—		
*procumbens	Sibbaldia...	by May 17, T.A.P.
Potentilla—		
anserina	Silver-weed	May 5, T.A.P.
reptans	... ...	May 19, (Pewsey) T.A.P.
Tormentilla	Tormentil	May 7, F.S.
fragariastrum. ...	Barren Strawberry ...	Mar. 2, E.im T.
Fragaria—		
vesca	Strawberry	fl. Ap. 4, J.S. fruit, June 7, H.E.B.
elatior	Haut-boy Strawberry ...	by May 19, H.
Rubus—		
Idæus	Raspberry	May 18, T.A.P.
cæsius	Dewberry	May 16, F.S.
—?	Bramble	May 19, P.T.M.
Geum—		
urbanum	Avens	*Ap. 12; (wild) May 3, F.S.
rivale	Water Avens	*Ap. 12; (wild) May 1, F.S.
Rosa—		
micrantha	... ...	June 10, F. S.
canina	Dog Rose...	May 23, F. S.
arvensis	Trailing Dog-Rose	May 31, E. im T.
Crataegus—		
Oxyacantha	Hawthorn	leaf Mar. 1, E.H.W. & L.C.C. fl. May 6, P. T. M.
Pyrus—		
*aucuparia	Rowan Tree	May 3, G. W. D. L.
*Japonica	Rose Japonica...	Feb. 14, T. A. P.
apple	... ...	Ap. 16, H. E. B.
apricot...	... ...	Mar. 14, H. E. B.
almond	... ...	Ap. 5, H. E. B.
peach	... ...	Mar. 14, H. E. B.
pear	... ...	Mar. 25, J. W. D.
plum	... ...	Mar. 22. H. E. B.
Epilobium—		
montanum	Broad leaved Willow-herb	Newbury, May 19, F. S. Chiseldon, June 1,
Circæa—		
lutetiana	Enchanter's Nightshade	June 16, E. im T.

Montia—		
fontana	Water-blinks	Mar. 21, E. im T.
Bryonia—		
dioica	Red-berried Bryony ...	May 19 (Hungerford), F. S.
Spergula—		
arvensis	Corn Spurrey...	May 15, J. S.
Sedum—		
* Rhodiola	Rose-root...	April 26.
album	White Stonerop	June 12, E. im T.
acre	Biting Stonecrop	June 2, J. S.
		June 3, E. im T.
Ribes—		
* Grosularia ...	Gooseberry	March 15, E. im T.
* nigrum	Black Currant	leaf March 28, G. C. M.
rubrum	Red Currant	March 22, J. W. D.
* sanguineum ...	Scarlet Ribes	March 13, E. im T.
* aureum	Golden Ribes	April 2, E. im T.
Saxifraga—		
* umbrosa	... ...	May 11.
* hirsuta	... ...	May 4.
tridactylites	Rue-leaved Saxifrage ...	March 14, T. A. P.
granulata	Meadow Saxifrage	April 25, E. im T.
* oppositifolia ...	... ...	Feb. 22.
* geranifolia ...	... ...	May 3.
* cæspitosa ...	... ...	May 11.
* crassifolia ...	... ...	March 14.
Philadelphus—		
* coronarius ...	Syringa	May 23, G. H.
Sanicula—		
europæa	Sanicle	May 19, E. L. H. & J. B. F.
Ægopodium—		
Podagraria ...	Gout-weed	May 19, (Pewsey & Calne)
Bunium—		
flexuosum	Pig-nut	May 15, E. im T.
Bupleurum—		
* falcatum	Sickle-leaved Hare's-ear	nearly out June 3.
Œnanthe—		
crocata	Water Hemlock	by June 2, J. S.
Meum—		
* athamanticum	Bald Money	May 11.

Pastinaca—		
sativa	**Parsnip**	**May 10, F. S.**
Heracleum—		
Sphondylium ...	**Hog-weed**	**May 3, E. im T.**
		May 15, F. S.
Daucus—		
Carota...	**Wild Carrot**	**May 16, F. S.**
Torilis—		
Anthriscus		**June 14, F. S,**
Scandix—		
Pecten-Veneris ...	**Venus'-comb**	**May 13, Savernake, E. im T.**
		May 16, (Marlboro') F. S.
Anthriscus—		
sylvestris	**Cow chervil**	**March 11, E. im T.**
		March 30, E. im T.
Chærophyllum—		
temulum	**Rough Cherril**...	**May 16, E. im T.**
Adoxa—		
Moschatellina ...	**Moschatel**	**Feb. 27, E. im T.**
Cornus—		
sanguinea	**Dog-wood**	**leaf April 21, E. J. T.**
		fl. May 27, E. im T.
***mascula**	**Cornel Cherry**	**Feb. 28, T. A. P.**
Sambucus—		
nigra	**Elder**	**leaf Feb. 25, E. im T.**
		fl. May 14, F. S.
Virburnum—		
Lantana	**Wayfaring Tree**	**leaf March 22, H. L.**
		fl. April 20, F. S. & E. J. T.
opulus	**Guelder Rose**	**leaf April 7.**
		fl. May 16, E. J. T.
		fertile fl. May 21, F. S.
*** Laurustinus** ...	**Laurustinus**	**April 17, E. im T.**
Lonicera		
*** Caprifolium**		**April 28, F. S.**
Periclymenum ...	**Honeysuckle**	**June 3, F. S.**
xylosteum		**Hungerford, May 19, F. S.**
*** Pyrenaica**...		**April 16, H. E. B.**
Sherardia—		
arvensis	**Blue Sherardia**	**May 2, E. im T.**

Asperula—		
cynanchica	Quinancy-wort	June 11, E. im T.
odorata	Sweet Woodruff	* April 15; April 28, E. im T.
Galium—		
cruciatum	Cross-wort	April 19, F. S. & E. J. T.
Aparine	Cleavers	May 9, F. S.
Mollugo	Bastard Madder	May 31, F. S.
verum	Yellow Bedstraw	June 19, F. S.
saxatile	Heath Bedstraw	cold. buds May 20, J. W. H. Chiseldon, June 1.
uliginosum		May 19, T. A. P.
Centranthus—		
* ruber	Spur Valerian	May 16, E. im T.
Valeriana—		
officinalis	Great Valerian	full June 10, F. S.
dioica	Marsh Valerian	May 2, F. S.
Valerianella—		
olitoria	Corn Salad	April 12, T. A. P.
Dipsacus—		
sylvestris	Teasel	bud June 19, F. S.
Knautia—		
arvensis	Field Knautia	May 31, J. S.
Scabiosa—		
succisa	Scabious	Chiseldon, June 1.
Columbaria... ...	Small Scabious	May 31, F. S.
Petasites—		
vulgaris	Butter-bur	Feb. 28, T. T.
Tussilago—		
farfara	Colt's-foot	Feb. 21, H. M. H. & A. C. H.
Bellis—		
perennis	Daisy	all the year.
Inula—		
* Helenium... ...	Elecampane	June 14, E. im T.
Achillea—		
* tomentosa ...	Yellow Milfoil	May 21, E. im T.
Millefolium ...	Milfoil	May 31, F. S.
Anthemis—		
arvensis	Corn Chamomile	June 3, E. im T.
Matricaria—		
inodora	Corn Feverfew	Ap. 10, (Savernake) F. S. May 9, F. S.

Chrysanthemum—		
Leucanthemum ...	Ox-eye	May 16, F. S.
Filago—		
germanica	Cudweed...	bud June 14, F. S.
Doronicum—		
* Pardalianches...	Leopard's Bane	Ap. 26
Senecio—		
vulgaris	Groundsel	all the year
Jacobæa	Ragwort	cold. bud June 19, F. S.
campestris	Field Flea-wort	May 31, F. S.
Arctium—		
majus	Burdock	bud June 10, F. S.
Serratula—		
tinctoria	Saw-wort	by June1, (Chiseldon) W.H.M.
Centaurea—		
Scabiosa	Greater Knapweed ...	June 5, J. B. F. & S. S.
Carduus—		
nutans...	Musk Thistle	May 19, F. S.
crispus...	Welted Thistle	May 19, P. T. M.
palustris	Marsh Thistle	May 23, F. S.
acaulis...	Dwarf Thistle...	June 11, E. im T.
pratensis	... ...	June 1, B. J. G.
Lapsana—		
communis	Nipplewort	June 19, F. S.
Hypochœris—		
radicata	Cat's-ear	May 13, (Savernake) E.im T.
Apargia—		
hispida	Rough Hawkbit	May 19, (Bedwyn) T. A. P.
Tragopogon—		
minor	Goat's Beard	May 20, F. S.
Leontodon—		
Taraxacum	Dandelion	all the year; abundant Ap. 23.
Sonchus—		
asper	Sow Thistle	May 16, F. S.
arvensis	Field Sow Thistle	June 5, T. A. P.
Mulgedium—		
* alpinum	Blue Sow Thistle	June 15, E. im T.
Crepis—		
virens	Smooth Hawk's-beard ...	Ap. 24, E. im T.
Hieracium—		
Pilosella	Mouse-ear	May 16, F. S.

* aurantiacum ...	Orange Hawkweed... ...	June 11, E. im T.
Rhododendron—		
—?		May 4, E. J. T.
Ilex—		
Aquifolium	Holly	May 13, F. S.
Ligustrum—		
*vulgare	Privet	Ramsbury June 6, F. S. Marlb. June 14, E. im. T.
Fraxinus—		
excelsior	Ash	April 5, T. A. P.
Syringa—		
*vulgaris	Lilac	May 3, G. W. D. L.
Vinca—		
minor	Lesser Periwinkle	by Feb. 25, M. O. A.
major	Greater Ditto	full bud April 9, J. W. M.
Gentiana—		
*acaulis		about April 5, H. E. B.
Menyanthes—		
trifoliata	Buck-bean	May 6, R. P. and R. H. B.
Convolvulus—		
arvensis		May 31, F. S.
Cynoglossum—		
officinale	Hounds'-tongue	May 19, H. E. P.
Borago—		
*officinalis—	Borage	May 20, P. T. M.
Symphytum—		
officinale	Comfrey	April 22, F. S, & E. J. T.
*asperrimum		May 17, E. im. T.
Echium—		
vulgare	Bugloss	June 15, E. im. T.
Pulmonaria—		
*officinalis	Lungwort	March, 6, T. A. P.
Lithospermum—		
arvense	Gromwell	April 29, T. E. M. (Ramsbury)
Myosotis—		
palustris	Forget-me-not	May 19. J. S.
arvensis	Field Scorpion-grass ...	April 4, E. J. T.
collina	Dwarf Ditto	May 1, E. im T.
versicolor	Changeable Ditto	full (Oare) May 6, F. S. & E. J. T.
Solanum—		
Dulcamara	Bitter-sweet	May 31, F. S.

Atropa—		
*Belladonna..	Deadly Nightshade	May 21, E. im. T.
Orobanche—		
minor	Broom-rape	full fl. June 3, J. B. F. and F. J. H. J.
Lathræa—		
squamaria	Tooth-wort	by April 3, E. im T.
Verbascum—		
Thapsus	Mullein	fl.Hungerford,May19W.H.M. fl. (Marlboro) June 14, H.D. and A. W. B.
nigrum	Black Mullein	June 19, J. S.
Digitalis—		
*purpurea	Fox-glove	cold. buds, May 19, F. S.
Linaria—		
Cymbalaria... ...	Ivy-leaved Toad-flax ...	April 8, E. im T.
minor	Calf's Snout	by June 11, E. im T.
vulgaris	Common Toad-flax ...	June 10, F. S.
Scrophularia—		
nodosa...	Knotted Fig-wort	May 27, F. J. H. J.
aquatica	Water Fig-wort	June 3, J. S.
* vernalis	Yellow Fig-wort	March 18, E. im T.
Melampyrum—		
pratense	Cow-wheat	May 9, F. S.
Pedicularis—		
sylvatica	Louse-wort	April 29, F. S.
palustris	Marsh Louse-wort	not in bud June 8.
Rhinanthus		
Crista-galli	Yellow-rattle	May 15, F. J. H. J.
Euphrasia—		
officinalis	Eye-bright	June 10, F. S.
Odontites	Red Bartsia	June 13, F. S.
Veronica—		
Anagallis	Long-leaved Speedwell...	May 19, T. A. P.
Beccabunga ...	Brook lime	May 10, J. S.
Chamædrys ...	Germander Speedwell ...	April 1, E im T. April 21, E. J. T.
serpyllifolia ...	Thyme-leaved Speedwell	April 9, J. S.
arvensis	... ...	fl. & seed May 19.
agrestis	Field Speedwell	fl & seed Feb. 13, E. im T.

polita	Grey Field Speedwell ...	Feb. 12, E. H. B.
Buxbaumii		seed Feb. 13, E. im T. seed Feb. 21, A. C. H. and H. M. H.
hederifolia	Ivy-leaved Speedwell ...	Feb. 13, E. im T.
Salvia—		
* verbenaca ...	Clary	by May 28, E. im T.
Thymus—		
serpyllum	Wild Thyme	May 31, J. S.
Scutellaria—		
* scorpioides		June 22, E. im T.
Prunella—		
vulgaris	Self-heal	June 11, E. im T.
Nepeta—		
Glechoma	Ground Ivy	March 14, E. im T.
Lamium—		
amplexicaule ...	Hen-bit	by April 26, T. A. P.
purpureum	Red Dead-nettle	Feb. 13, E. im T.
album	White Dead-nettle... ...	full Feb. 20, M. O. A.; and all the year.
* maculatum ...	Spotted Dead-nettle ...	Feb. 29.
Galeobdolon ...	Archangel	April 10, J. W. M.
Betonica—		
*grandiflora		June 14, E. im. T.
Melissa—		
*grandiflora		June 2, E. im T.
Stachys—		
Betonica	Wood Betony	Chiseldon, June 1, T. A. P.
sylvatica	Hedge Woundwort ...	May 31, J. S.
Ajuga—		
reptans	Bugle	April 28, F. S.
Primula—		
vulgaris	Primrose	a few all the year.
veris	Cowslip	April 5, F. S.
Lysimachia—		
* thyrsiflora ...	Tufted loose-strife	June 20, E. im T.
nemorum	Yellow Pimpernel	May 13, J. S.
Anagallis—		
arvensis	Scarlet Pimpernel	May 19, H.

Dodecatheon—		
* meadea	American Cowslip	April 30.
Plantago—		
lanceolata	Ribwort	April 3, F. S.
media	Lamb's-tongue	May 19, T. A. P.
major	Greater Plantain	June 3, E. im T.
Chenopodium—		
Bonus Henricus...	Good King Henry... ...	full fl. May 19, T. T.
Rumex—		
obtusifolius... ...	Broad-leaved Dock ...	May 19, T. A. P.
crispus	Curled Dock	May 16, F. S.
acetosa	Sharp Dock	by May 16, E. im T.
Acetosella	Sheep's Sorrel	April 25, F. S. & E. J. T.
Polygonum—		
Bistorta	Snake-weed	May 17, R. P.
amphibium	... ...	June 6, J. S.
aviculare	Knot-grass	June 11, E. im T.
Daphne—		
* Mezereum ...	Mezereum	Feb. 12.
* Laureola... ...	Spurge-laurel	by Feb. 21.
Asarum—		
* europæum ...	Asarabacca	March 14.
Buxus—		
* sempervirens ...	Box	March 14, E. im T.
Euphorbia—		
Helioscopia ...	Sun Spurge	bud March 18, E. im E.
amygdaloides ...	Wood Spurge	April 22, E, im T.
Mercurialis—		
perennis	Dog's Mercury	Feb. 26 & March 9, E. im T.
Callitriche—		
verna	Vernal Star-wort	May 21, T. A. P.
Urtica—		
urens	Roman Nettle	May 21, E. im. T.
dioica	Stinging Nettle	nearly out May 19, T. T.
Ulmus—		
suberosa	Common Elm	May 5. full bud Feb. 16, E. im. T.
montana	Wych Elm	leaf May 20. fl. Feb. 27, *Mrs. Blake.*

Salix—		
caprea	Sallow	leaf April 5. H. D.
		fl. Feb. 23, J. W. D.
		Feb. 28, J. A. L.
		fertile fl. March 2, E. im. T.
Populus—		
nigra	Black Poplar	full fl. March 30, E. im. T.
Betula—		
glutinosa	Birch	April 26, F. S.
Fagus—		
sylvatica	Beech	leaf May 2, G. W. D. L.
		fl. (Hungerford) May 19, F.S.
Quercus—		
Robur	Oak	leaf (full) May, 19.
		fl. May 14, J. S.
Corylus—		
Avellana	Hazel	leaf April 26.
		fl. by Feb. 13. R. P.
		Feb. 13, R. M. B. G.
Carpinus—		
Betulus	Hornbeam	leaf May 13 E. im. T.
		fl. March 27, E. im. T.
Juglans—		
regia	Walnut	by May 23, T. A. P.
Taxus—		
baccata	Yew...	full fl. Feb. 26, E. im. T.
Juniperus—		
communis	Juniper	fl. Ap. 25, F. S. and E. J. T.
Pinus—		
sylvestris	Scotch Fir	May 2, F. S.
Larix—		
*europæa	Larch	March 13, E. J. T.
Paris—		
*quadrifolia... ...	Herb Paris	by April 22, E. im. T.
Tamus—		
communis	Black Bryony	May 21, F. S.
Orchis—		
Morio	Green-winged Orchis ...	April 30, E. im T.
mascula	Early Purple Orchis ...	Aprril 21, F. S. & E, J. T.
ustulata	Dwarf Orchis	May 19, C. F. H.
maculata	Spotted Hand Orchis ...	May 20, F. S.

latifolia	Marsh Orchis	by June 1, F. S.
pyramidalis ...	Pyramidal Orchis ...	June 3, E. im T.
incarnata	... ...	May 25, F. S.
Gymnadenia—		
conopsea	Fragrant Orchis... ...	June 1, G. H.
Habenaria—		
viridis	Frog Orchis	*May 21.
bifolia		full fl. June 20, F. S.
chlorantha	Butterfly Orchis... ...	May 21, J. B. F. & E. L. H.
Ophrys—		
apifera...	Bee Orchis	June 21, M. O. A.
Listera—		
ovata	Tway-blade	May 9, F. S.
Neottia—		
Nidus-avis	Bird's-nest Orchis ...	May 6, E. im T.
Epipactis—		
latifolia	Helleborine	bud June 18, F. J. H. J.
Cephalanthera—		
grandiflora	... ...	full fl. May 21, F. J. H. J.
Sisyrinchium—		
* anceps	... ...	May 28, E. im T.
Iris—		
Pseud-acorus ...	Yellow Iris	May 19, J. W. H.
Crocus—		
*	... ...	by Feb. 13, E. im T.
Narcissus—		
poeticus	... ...	* April 16, E. im T.
Pseudo-narcissus	Daffodil	by Feb. 26, M. O. A.
Leucojum—		
*æstivum	Summer Snowflake ...	April 8.
Galanthus—		
nivalis	Snowdrop	about Feb. 3, T. W. D.
Convallaria—		
*majalis	Lily of the Valley ...	April 27, E. im T.
Polygonatum—		
multiflorum ...	Solomon's Seal	May 2, E. im T.
Ruscus—		
aculeatus	Butcher's Broom ...	April 8, E. im T.
Tulipa—		
sylvestris	Wild Tulip	March 30, M. O. A.

Fritillaria—		
*Meleagris	Snake's Head	March 30, E. im T.
*imperialis	Crown Imperial	April 4, E. im T.
Scilla—		
*bifolia	Twin-leaved Squill ..	March 5.
*Sibirica	Siberian Squill	by March 5.
*cernua	... ...	April 23.
Allium—		
*Schœnoprasum	Chive Garlic	by May 25.
ursinum	Ramsons—	April 30, E. im T.
Endymion—		
nutans	Blue Bell	April 5, J. S. P.
Muscari—		
*racemosum ...	Grape Hyacinth ...	March 26.
Juncus—		
effusus	Soft Rush	bud May 19.
glaucus	... ...	bud May 19.
Luzula—		
pilosa	Wood-rush	March 16, H. M. H.
campestris ...	Field-rush	April 6, E. im. T.
Alisma—		
Plantago ...	Water Plantain	June 2, T. A. P.
Arum—		
maculatum ...	Cuckoo-pint	April 10, J. W. M.
Potamogeton—		
natans ..	Floating Pondweed ...	May 19, T. A. P.
densus ...	Frogs' Lettuce ...	May 19, T. A. P.
Zannichellia—		
palustris ...		by May 21, T. A. P.
Eleocharis—		
palustris ...	... ...	May 19, T. A. P.
Scirpus—		
sylvaticus ...	... ...	bud May 19, E. E. S.
Carex—		
pulicaris ...		... seed June 10, E. im. T.
divulsa ...	Grey Sedge	... May 3, E. im. T.
vulpina . .	Great Rough Sedge	... May 13, F. S.
*pendula ...	Pendulous Sedge	... by May, 5.
præcox ...	Vernal Sedge	... by May 5, T. A. P.
glauca ...	Glaucous Sledge	... April 25, E. J. T. and F. S.

sylvatica	... Wood Sedge	...	April 29, E. im. T.
riparia	... River Sedge	...	April 22, E. J. T. and F. S.
hirta	... Hairy Sedge	...	by May 19, T. A. P.
ovalis	...		seed June, 1, T. A. P.
Phalaris—			
arundinacea	... Great Reed-grass	...	June 1, T. A. P.
Anthoxanthum—			
odoratum	.. Sweet Vernal grass		April 22 E. im. T.
Alopecurus—			
pratensis	... Fox-tail grass	...	April 14, E. im. T.
geniculatus	... Floating ditto	...	June 2, T. A. P.
agrestis	... Black-grass		May 13, F. S.
Milium—			
effusum	... Millet	...	May 6, E. im. T.
Holcus—			
mollis	... Soft Grass	...	April 21, T. A. P.
Aira—			
cæpitosa	... Hair Grass	...	Nearly out, June 8, T. A. P.
Trisetum—			
flavescens	... Yellow Oat-grass	...	June 1, F. S.
Avena—			
pratensis	... Narrow-leaved ditto	...	May 24, R. H. B.
pubescens	... Downy ditto	...	May 13, E. im T. & F. S.
Arrhenatherum—			
avenaceum	... Oat-grass	...	May 20, F. S.
Koeleria—			
cristata	... Crested Hair Grass	...	May 27, E. im E.
Melica—			
uniflora	... Melic	...	April 30, E. im T.
Poa—			
annua	... Annual Meadow-grass	...	March 2, E. im T.
nemoralis	... Wood ditto	...	May 15, F. S.
trivialis	... Rough ditto	...	May 13, E. im T.
pratensis	... Common ditto	...	April 23, E. im T.
Glyceria—			
fluitans	... Flote-grass		May 19, T. A. P.
plicata	... •		May 1, E. im T.
Briza—			
media	... Quaking Grass	...	Bedwyn, May 19, T. A. P. Marlboro', May 24, R. H. B.

Cynosurus—			
cristatus	...	Dog's-tail Grass	May 25, E im T.
Dactylis—			
glomerata	...	Cock's-foot Grass ...	May 13, E. im T.
Festuca—			
ovina	...	Sheep's Fescue ...	Full fl. June 8.
rubra	...	Creeping Fescue ...	May 13, E. im T.
sciuroides	...		Bud June 2, T. A. P.
Bromus—			
erectus	...	Upright Brome-grass ...	May 19.
asper	...	Hairy ditto ...	June 16, E im T.
sterilis	...	Barren ditto ...	May 13, F.S.
Serrafalcus—			
racemosus	...	Field ditto ...	May 25, T. A. P.
commutatus	...	Lop-grass ...	By May 25, T. A. P.
mollis	...	... ...	April 22, E im T.
Triticum—			
caninum	...	Rye Grass ...	Nearly out, June 14, E. im T.
Lolium—			
perenne	...		May 4, E. im T.
Barley, ear	...		June 18, T. L. D. & E. F. B.
Rye, ear	...		May 10, G. W. D. L.
Wheat, fl.	...		June 9, G. W. D. L.
Equisetum—			
arvense	...	Corn Horsetail ...	fertile, April 10, F. S.
			barren April 28, G. A. L.
limosum	...	Smooth ditto ...	May 13, J. S.
palustre	...	Marsh ditto	May 13, F. S.
Botrychium—			
Lunaria		Moonwort	May 1, G. H.
Ophioglossum—			
vulgatum		Adder's Tongue	May 2, P. T. M.

NEW LOCALITIES.

Myosurus minimus	Near Pewsey, T. A. P.
Ranunculus peltatus	Huish, J. S.; Pewsey, J. S.
Ranunculus hederaceus ...	Pewsey, J. S.; Reading, F. J. H. J.
Ranunculus Flammula ...	Fox Wood, T.A.P.; Swindon Reservoir, E.im T. near Ramsbury, E.im T.; Reading, F.J.H.J.
Aquilegia vulgaris	Wan's Dyke, P. T. M.
Viola canina	Marlborough Common, T. A. P.

Stellaria uliginosa	Mildenhall, T. A. P.
Malva rotundifolia	Overton, J. S.
Genista tinctoria	Chiseldon, F. J. H. J.
Lotus major	Marsh near Ramsbury, T. A. P.
Vicia sylvatica	West Woods, T. A. P.; Martinsell, E. im T. Bignall, F. S.
Fragaria elatior...	Near Martinsell, H.
Rosa micrantha	Half-way between Marlborough and Bignall, F. S.; Oare, F. S.
Spergula arvensis	Chiseldon, E. im T.
Senecio campestris	Rabley Down and Bath Road, F. S.
Serratula tinctoria	Chiseldon, W. H. M.
Lathræa Squamaria	Ramsbury, T. A. P.; Savernake, W. W.; West Woods, E. im T.; Littlecote, J S.
Verbascum nigrum	Overton, J. S.
Polygonum Bistorta	Near Clench Common, C. W. T.
Daphne Laureola	Ramsbury, T. A. P.
Orchis Latifolia	Mildenhall, F. S.; Lockeridge, J. S.; Martinsell, E. im T.; Stitchcomb, J. S.
Habenaria viridis	Oare, F. S.
Habenaria bifolia	Mildenhall, F. S.
Ophrys apifera	White Horse Down, M. O. A.
Carex hirta	Bedwyn, T. A. P.
Ophioglossum vulgatum ...	Near the Wan's Dyke by the Railway, W. S. B.

NEW SPECIES.

Nasturtium palustre	Great Bedwyn, G.W.D.L.; Lockeridge, T.A.P.
Nasturtium sylvestre ...	Swindon Reservoir, F. J. H. J.
Astragalus Glycyphyllos ...	Bignall, F. S.
Galium uliginosum	Chiseldon, T. A. P.
Linaria minor	
Carduus pratensis	Chiseldon, B. J. G.
Paris quadrifolia...	Ramsbury, E. im T.
Orchis incarnata...	Mildenhall, F. S.; near Ramsbury, F. S.; Lockeridge, J. S.
Epipactis latifolia	Savernake Forest, F. J. H. J.
Scirpus sylvaticus	Calne, E. E. S.
Carex ovalis	Swindon Reservoir, E. im T.; near Ramsbury, T. A. P.
Festuca sciuroides	Lockeridge, T. A. P.

ORNITHOLOGY.

THE following are the names of those who occur in the following list:—

F.F.B. ... ... F. F. Back.
G.H.B. ... ... G. H. Baily.
F.B. ... ... F. Borlase.
G.W.C. ... ... G. W. Creaton.
J.B.F. ... ... J. B. Fuller.
R.M.B.G. ... ... R. M. B. Glasse.
J.W.H. ... ... J. W. Harvey.
G.H. ... ... G. Holden.
R.A.I. ... ... R. A. Illingworth.
F.J.H.J. ... ... F. J. H. Jenkinson.
G.K. ... ... G. Knubley.
J.H.L. ... ... J. H. Lambert.
C.E.L. ... ... C. E. Lawson.
P.M. ... ... P. Macquoid.
J.B.O. ... ... J. B. Oakeley.
G O. ... ... G. Owen.
R.P. ... ... R. Phayre.
S.A.R. ... ... S. A. Rogers.
H.S. ... ... H. Simpson.
C.A.S. ... ... C. A. Sladen.
H.C.S. ... ... H. C. Spry.
E. im T. ... ... E. im Thurn.
T.T. ... ... T. Tilleard.
F.F.W. ... ... F. F. White.

Kestrel (Falco tinnunculus)—egg May 8th, S. A. R.
Sparrow Hawk (Falco nisus) egg May 9th, E. im T.
Barn Owl (Strix flammea) young birds, observed by E. im T, April 22nd.
Tawney Owl (Strix aluco) young birds taken by — Fenwick, April 29th.
Spotted Flycatcher (Muscicapa grisecla)—young birds, May 30th, E. im T.
Missel Thrush (Turdus viscivorus)—egg March 16th, S. A. R.
Fieldfare (Turdus pilaris)—seen April 18th, F. J. H. J.
Song Trush (Turdus musicus)—egg March 13th, G. H.
Blackbird (Turdus merula)—egg March 22nd, S. A. R.

Ring Ouzel (Turdus torquatus)—seen April 17th, E. im T.; egg May 4th, T. T.
Hedge Sparrow (Accentor modularis)—egg, F. B.—H. S.
Redbreast (Sylvia rubicula)—5 eggs March 29th, R. P.
Redstart (Sylvia phœnicurus)—seen April 13th, E. im T.; egg May 4th, J. B. F.
Stone-chat (Sylvia rubicola)—seen April 7th, E. im T., egg May 14th, G. O.
Wheat-ear (Sylvia œnanthe)—seen March 28th, E. im T.
Sedge Warbler (Sylvia phragmitis)—egg April 25th.
Reed-wren (Sylvia arundinacea)—egg May 15th, E. im T.
Black-cap (Sylvia atricapilla)—seen April 22nd, E. im T., egg May 8th, C.E.L.
Whitethroat (Sylvia cinerea)—seen May 5th, F. J. H. J.—egg May 19th, J.B.O.
Wood-wren (Sylvia sibilatrix)—seen May 6th, F. J. H. J.—egg May 18th, E. im T.
Willow-wren (Sylvia trochilus)—seen April 21st, E. im T.—egg may 4th, E. im T.
Chiff-chaff (Sylvia rufa)—seen March 29th, E. im T.
Great Tit (Parus major)—egg April 16th, H. C. S. and R. M. B. G.
Blue Tit (Parus cæruleus)—egg April 13th, E. im T.
Cole Tit (Parus ater)—egg May 30th, F. J. H. J.
Long-tailed Tit (Parus caudatus)—egg April 19th, H. C. S.
Pied Wagtail (Motacilla Yarrellii)—egg May 10th, T. T.
Meadow Pipit (Anthus pratensis)—egg May 11th, E. im T.
Sky Lark (Alauda arvensis)—egg April 30th, S. A. R.
Yellow-hammer (Emberiza citrinella)—egg April 15th, E. im T.
Chaffinch (Fringilla cœlebs)—egg April 26th, F. F. W.
House Sparrow (Fringilla domestica)—egg April 30th, F. F. B.
Greenfinch (Fringilla coccothraustes)—egg May 8th, G. W. C.
Goldfinch (Fringilla carduelis)—egg May 21st, S. A. R.
Linnet (Fringilla cannabina)—egg May 8th, J. B. O.
Starling (Sturnus vulgaris)—egg April 18th, C. A. S.
Rook (Corvus frugilegus)—egg March 17th, T. T.—R. A. I.
Jackdaw (Corvus monedula)—egg April 13th, J. H. L.
Magpie (Corvus pica)—egg April 18th, F. B.
Green Woodpecker (Picus viridis)—egg May 18th, E im T.
Spotted Woodpecker (Picus major)—obtained May 28th, E. im T.
Creeper (Certhia familiaris)—egg May 4th, G. K.
Wren (Troglodytes europæus)—egg May 1st, E. im T.
Cuckoo (Cuculus canorus)—seen April 8th, G. H. B.; egg May 8th, P. M.
Swallow (Hirundo rustica)—seen April 3rd, J. W. H.; egg May 15th, T. T.
Martin (Hirundo urbica)—seen April 21st, E. im T.

Sand Martin (Hirundo riparia)—seen April 8th, S. A. R.
Swift (Cypselus apus)—seen April 22nd, E. im T.
Stock Dove (Columba œnas)—egg March 21st, T. T.
Turtle Dove (Columba Turtur)—seen May 30th, E. im T.
Pheasant (Phasianus colchicus)—egg May 5th, E. im T.
Partridge (Perdix cinerea)—egg May 2nd, G. K.
Quail (Coturnix vulgaris)—seen April 21st, E. im T. Seven eggs, June 22, T. T.
Stone Curlew (œdicnemus crepitans)—seen April 15th, E. im T.; egg May 19th, G. H.
Lapwing (Vanellus cristatus)—egg March 28th, S. A. R. & J. B. O.
Common Sandpiper (Totanus hypoleucus)—seen April 20th, E. im T.
Land-rail (Gallinula crex)—seen April 22nd, E. im T.; egg May 20th, T. T.
Moorhen (Gallinula chloropus)—egg April 4th, E. im T.
Coot (Fulica atra)—seen plentifully at Swindon Reservoir, June 1st, E. im T.
Little Grebe (Podiceps minor)—egg April 11th, T. T.
Common Gull (Larus canus)—seen April 20th, E. im T.

The following donations have been made to the Ornithological Collection during the half:—

Specimens of the

1 Sparrow Hawk (Falco nisus)—by M. H. Smith.
1 Short-eared Owl (Strix brachyotus)—by Mr. Nichols.
1 Pied Flycatcher (Muscicapa atricapilla)—by ditto.
1 Song Thrush (Turdus musicus)—by ditto.
1 Golden-crested Wren (Regulus cristatus)—by J. B. Oakeley.
1 Meadow Pipit (Anthus pratensis)—by Mr. Nichols.
1 Yellow hammer (Emberiza citrinella)—by ditto.
1 Green Woodpecker (Picus viridis)—by ditto.
2 Spotted Woodpecker (Picus major)—by the Rev. T. A. Preston.
1 Swallow (Hirundo rustica)—by Mr. Nichols.
1 Martin (Hirundo urbica)—by ditto.
1 Swift (Cypselus apus)—by ditto.
3 Quail (Coturnix vulgaris)—by E. im Thurn.
1 Heron (Ardea cinerea) by M. H. Smith.
1 Snipe (Scolopax gallinago)—by Mr. Nichols.
1 Common Sandpiper (Totanus hypoleucus)—by Mr. Nichols.

Eggs of the following have been presented to the Society by H. C. Mercer, Esq.:—

Kestrel, Sparrowhawk, Red-backed Shrike, Pied Flycatcher, Song Thrush, Redstart, Stonechat, Whinchat, Wheatear, Sedge Warbler, Reed-wren (2),

Nightingale (2), Blackcap, Whitethroat, Willow-wren (2), Golden-crested Wren (9), Great Tit, Blue Tit, Pied Wagtail (2), Meadow Pipit, Skylark (3), House-sparrow (5), Greenfinch, Goldfinch (2), Linnet, Bullfinch (3), Rook (3), Jackdaw (5), Jay (2), Creeper (2), Wren, Swallow, Martin (3), Sand Martin (2), Swift, Nightjar (2), Turtle Dove, Lapwing (7), Sanderling, Common Sandpiper, Norfolk Plover, Dunlin, Moorhen (2), Dabchick (2), Red-throated Diver.

A model of a Great Auk's egg in the collection of Professor Newton has been presented by Mr. Baker, of Cambridge; and an egg of the White-tailed Eagle by C. E. Lawson.

A collection of Nests has also been started, and consists at present of about 40 specimens, the principal of which are:—

Red-backed Shrike	—presented by	E. im Thurn.
Missel Thrush	,,	,,
Song Thrush	,,	,,
Blackbird	,,	,,
Hedge-sparrow	,,	,,
Stone-chat	,,	,,
Whinchat	,,	,,
Wheatear	,,	,,
Grasshopper Warbler (?)	,,	C. A. Sladen.
Willow Wren	,,	E. im Thurn.
Golden-crested Wren (2)	,,	,,
Greater Titmouse	,,	,,
Long-tailed Titmouse	,,	H. C. Spry.
Pied Wagtail	,,	R. Phayre.
Meadow Pipit	,,	E. im Thurn.
Black-headed Bunting	,,	,,
Yellow-hammer	,,	,,
Chaffinch	,,	,,
Hawfinch	,,	Rev. J. S. Thomas.
Wren	,,	E. im Thurn.
Swallow	,,	C. M. Bull, Esq.

COLLECTION OF COINS.

SILVER COINS.

Groat of Edward I.—Mr. C. Brampton.

Ditto of Richard II.

Henry IV.
Edward VI.
Henry VIII.
Elizabeth
} by G. G. Monck.

James I.—by A. D. Nind.

Elizabeth—by E. C. Sewell.

Charles II., sixpence—by A. D. Nind.

Ditto, shilling—by J. C. Brown.

William and Mary, sixpence—by A. D. Nind.

Anne, shilling—by G. C. Brown.

George II., sixpence—by ditto.

Ditto, shilling and two shillings—by Freeman.

George III., two shillings—by E. C. Sewell.

Victoria, penny, three-half-pence, and twopence, by C. Irwin

COPPER COINS.

Charles I., half-penny.

William and Mary, penny—J. C. Brown.

Ditto, half-penny—A. D. Nind.

George II., farthing and penny, by ditto.

George III., 2d., by H. S. Dickinson.

Ditto, half-penny and farthing—by Churchill.

Ditto, penny and half-penny—by G. A. W. Tate.

George IV., farthing, halfpenny, and a penny—by ditto.

William IV., farthing, halfpenny, and a penny—by ditto.

ROMAN COINS, By J. C. Brown.

Silver denarius of Antonius Pius

Copper coin of ditto.

Ditto of Faustina.

Ditto of Commodus

And seven of which the inscriptions are unintelligible.

Coin of Constantius by A. D. Nind.

ACCOUNTS.

Receipts.	£	s.	d.	Expenditure.	£	s.	d.
Balance from last Half-year	3	8	10	Carriage of Minerals ...	0	2	0
Subscriptions	6	1	0	Paid Mr. Hillier	6	16	0
Donations	9	8	6	Candles	0	3	6
Sale of Report, Xmas, 1867	15	2	0	Gum	0	0	6
Sale of back Reports ...	1	0	0	Mr. Hillier	10	19	0
				Mr. Perkins	12	2	6
				Book Account	3	12	0
				Balance in hand.	1	4	10
	£35	0	4		£35	0	4

LIST OF DONATIONS.

	£	s.	d.
F. J. H. Jenkinson	0	1	6
G. H. Dawson	0	2	6
H. M. Hilton	0	2	6
C. E. G. Crawford	0	2	6
E. B. Henderson	0	2	6
A. Armstrong, Esq.	0	2	6
C. Hodgson, Esq., ...	1	0	0
Mrs. Norris, Epsom	1	1	0
Rev. J. S. Thomas	0	2	0
Miss Corrie	1	0	0
Sir M. Smith	1	0	0
P. P. Smith, Esq.	0	10	0
Rev. H. Bell	0	7	6
F. Storr, Esq.	0	17	6
R. F. Isaacson, Esq.	0	2	6
J. W. Mills, Esq.	1	10	6
A. C. Almack, Esq.	0	10	6
W. W. Dayman, Esq.	0	10	6
T. R. Dumergue, Esq.	0	2	0
Smaller	0	0	6
	9	8	6

ADDITIONS TO THE LIBRARY.

Vols.		Donor.
1.	Birds of Bucks and Berks...	H. R. H.Prince Leopold.
1.	Ditto	Rev.R.Duckworth.
2.	Stainton's Manual of British Butterflies and Moths ...	Rev. H. Bell.
2.	Humphrey's Coin Collector's Manual	G. G. Monck.
1.	Bate's Naturalist on the Amazons	G. H. Dawson.
1.	Stainton's British Butterflies and Moths	A. C. Almack, Esq.
1.	Rye's British Beetles	W. W. Dayman, Esq.
1.	Shuckard's British Bees ...	J. W. Mills, Esq.
1.	Plue's British Ferns	
1.	Wood's Geology for the Million	F. S. Strickland.
2.	Darwin's Animals and Plants under Domestication ...	Miss E. Corrie.
	Various papers on Natural History Subjects	Rev. A. C. Smith.
	Report of the Rugby School N. H. Society	The Society.
	List of Plants and Ferns within 4 miles of Rugby Close	F. C. Kitchener, Esq.
	Popular Science Review The "Student" } for the Half Year... ...	Rev. J. M. Fuller.
	The "Ibis" The "Entomologist" The "Entomologist's Monthly Magazine" } For the Half Year	Rev. T. A. Preston.
	The "Zoologist" The "Zoological Magazine" } for the Half Year	Purchased.

MARLBOROUGH :
C. PERKINS, PRINTER, HIGH-STREET.

PRIZE ESSAY ON PIGEONS, BY G. E. MANISTY.

1.—First, as to the Pigeon itself. It is hardly necessary for me to state that there are many different kinds of pigeons, totally differing from each other, as for instance the Carrier, whose rapid flight seems almost fabulous, and on the other hand the Fantail, a very poor flier indeed, and of quite a different appearance from the Carrier. The Tumbler is one of the prettiest, and in my opinion the most amusing species of all, and it is of Tumblers that I shall speak.

2.—Then as to the *nature* of the Pigeon. They are very *hot*-natured birds, so to speak, and when it is raining you mny constantly see them lying first on one side with one wing raised to let the rain fall under it and cool it, and then doing the same on the other. They are also very fond of a bathe, and will dip themselves into the muddiest water rather than have no bathe at all. *Salt* is very much to their taste, and it is generally believed that they will not leave a pigeon house while there is a lump of rock salt or indeed any salt in it. Pigeons, as it is pretty well known, have a very strong attachment to the place where they were born and reared. This is especially seen in Carriers, which will fly enormous distances to return to their old house. Tumblers, however, and other kinds soon get reconciled to a new abode, provided they are pretty happy there, that is to say if they have 'husbands' or 'wives' as the case may be, and other bird-like comforts. Pigeons of *every* species, I think I may say, have most ravenous appetites, and the Woodpigeon is (I believe truly) said to eat twice its own weight of food every day. Whenever I have shot Woodpigeons towards evening I have always found their crops as full as possible, even uncomfortably so, I should have imagined. An instance of this greediness in tame pigeons occurred once among my own set or 'kit' as it is generally called. I one day accidentally left the corn box open for a short time, when one of my pigeons hopped in without my noticing it, and was so intent on his food that he did not attempt to get out when the lid was shut down. I missed this pigeon the whole of the day and was beginning to think it must have strayed away or been captured, when on going to the box in the evening I there discovered the wretched bird looking a most piteous object. It had evidently been eating as fast as it possibly could until it was unable to eat any more; its crop was very much swollen out with corn, and it actually could not hold up its head, from the weight of the food it had stowed away. I thought at first that it would die, but the next morning it seemed almost recovered and ready for a repetition of the meal.

3.—*Habits*—Under this head I intend to include nearly all that I have to say. In order to explain how it was that I studied the habits of pigeons so closely, I must mention that I used to keep them in a double loft, and used to remain quiet in one while the pigeons were in the other.

Almost the first thing that I noticed on beginning to keep pigeons was the manner in which they at once get accustomed to any object; for instance, I brought a pair of Pigeons rather late one night into the loft, and put them on a beam to roost for the night. The next night I saw them at roost again in just the same place, which they occupied regularly ever afterwards. Again, if I put a little straw into a nest and put a pair of pigeons into it they would oftener than not keep to that nest. I once watched a very interesting fight for a nest. Two birds had had it for some time, and no doubt thought they were quite safe in their abode, when one day, for some reason or other, another pair took a fancy to the same nest. The male intruder flew up to the nest and tried to take quiet possession, but the old inhabitant of the same sex did not seem quite so willing to give it up, and a stand-up fight ensued. Perhaps it would be as well just to say a few words in passing on the manner of fighting among pigeons. They of course use their beaks, as we should naturally expect; but that is not all, for they also use their wings. Indeed I think the wing is by far the more formidable member, as the beak is not strong in Pigeons as it is in Jackdaws, &c., while the wing is very powerful, to enable the bird to fly with the speed and endurance for which it is remarkable. But to return to where we left the combatants, they first began fighting in the small box where the disputed nest was, but not finding room to exert their full strength, I suppose, they adjourned to a convenient broad ledge and there pecked and struck out with their wings to their heart's content. I watched them until they were so tired that they were both forced to retire from the lists for breathing time. I then left them, but in the afternoon I again went to see what they had decided about the nest, and lo! they were hard at it again. The contest was decided that evening, and the old inhabitants were turned out. Pigeons, like other "gentle doves," are by no means so gentle as is generally supposed, but, on the contrary, fighting is rather a favourite amusement with them, and some of them carry the science to a high pitch of perfection. Though Pigeons are so quarrelsome with one another, they certainly are gentle to men, and often become very much attached to a person who feeds them and treats them kindly. I had mine very tame for some time, and if I held out my hand and whistled they would immediately fly down and settle on me and begin hunting about for something to eat. Sometimes I used to put a pea between my lips, and they would peck at it in a most indefatigable manner, until I let them have it. One great favourite that I had used frequently to drink out of a wine-glass, sitting on my hand.

It is very amusing to place a looking-glass where the Pigeons can get at it, for either from conceit or some other cause, they strut about before it, and coo and spread their tails out in a ludicrous manner; and every now and then they go to look for the imaginary pigeon, their own likeness, behind the glass where of course they see nothing and return to re-assure themselves that

there was really something before, which they were cooing at. I think for my own part that it is rather a fallacy to suppose, as is sometimes done, that a glass has the power of attracting stray pigeons, and of making your own pigeons stay at home, instead of wandering away as they are occasionally apt to do.

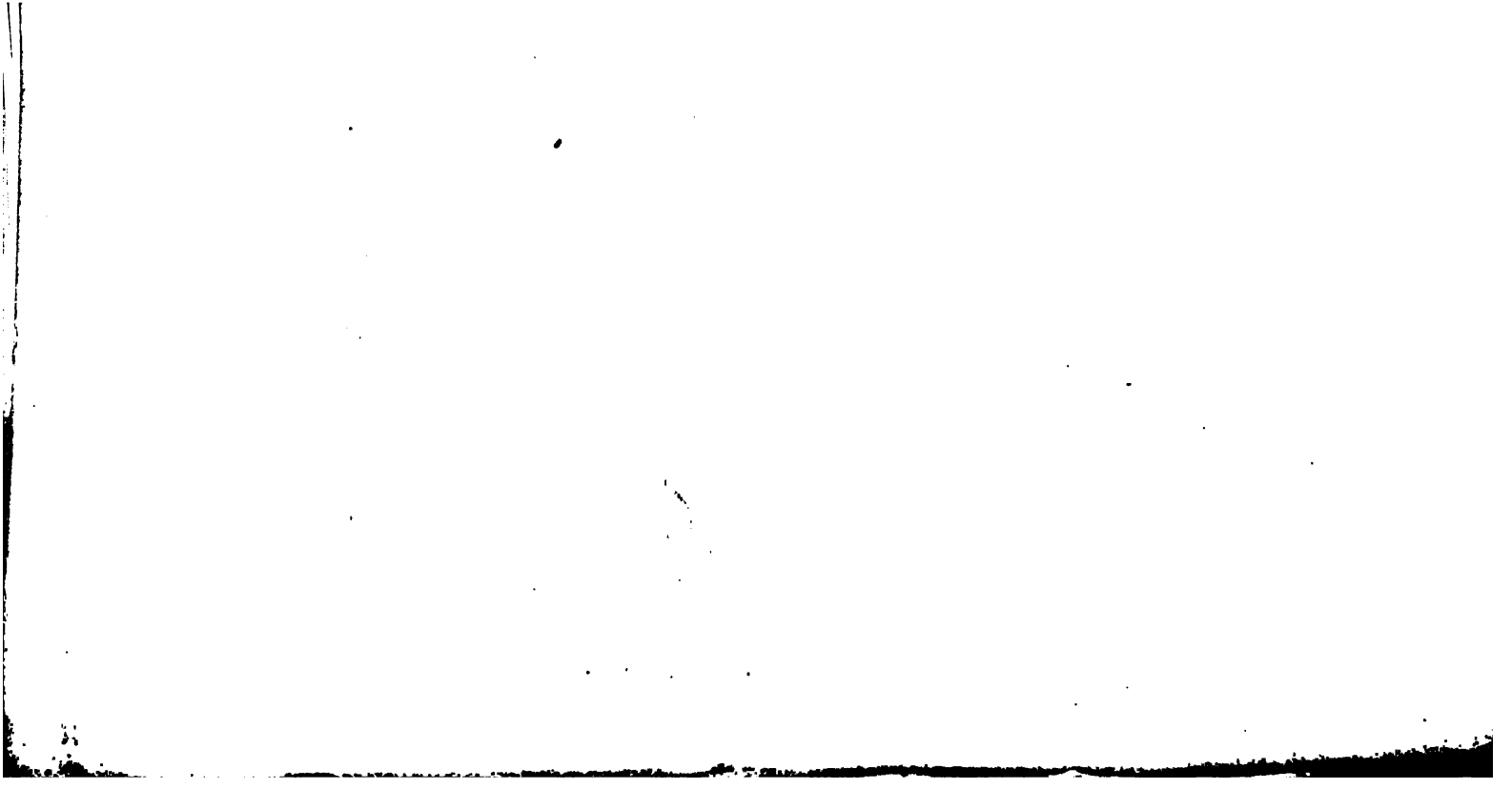
The most interesting time to watch the habits of Pigeons is when they are breeding, to see them building their nests, hatching their eggs, and feeding their young, all in the most systematic, regular, manner.

The nest is not an object of much care to them, and they will sometimes lay their eggs on the bare floor or wherever the nest should be. When they do build one, they make it of straw, and one sits inside arranging the straws one by one as the other supplies them. When the nest is completed they are not long before they make use of it. I noticed that they *always* laid the first egg somewhere about 4 o'clock in the afternoon, and then after missing a day they would lay the second between 1 and 2 o'clock in the day time, two days after the first. This rule was never once broken while I kept pigeons, which is one instance of the regularity I mentioned. Almost directly after the second egg (for they never have more than two, at least I never saw one with more) they begin the operation of sitting, the most troublesome of all I should say, or rather perhaps the most trying, as they have to be sitting constantly on the eggs for about three weeks, *i.e.* to say from 19 to 21 days. They are never less than 19, but sometimes they are one, or perhaps two days over the 21, before they hatch. Here again they shew their systematic nature, for when the eggs have been hatched they carefully put one half of the shell inside the other and generally throw them out of the nest. If ever you have seen eggs broken for cooking purposes, I have no doubt you will have noticed the cook treat the shells just as pigeons do. Sometimes one egg is hatched a day or so before the other, and very often either one or both of them become addled. The reason for this, I imagine, is in some cases that mice get into the nest and disturb the birds when sitting, but no doubt there are other causes as well. Some pigeons in fact do not seem to like the trouble of sitting on their eggs, and leave them until they get cold and become addled. Others again go to just the opposite extreme, and like to be sitting always. I had a pair which never had any eggs, but were for all that very fond of building nests and sitting by the week together on imaginary eggs. I thought it would be rather a good thing to give them something to take care of, and so I put a Wood-pigeon's egg in their nest. They seemed highly pleased with the acquisition, began at once to sit, and hatched it in due time. The young pigeon was growing very fast and had attained a considerable size, when one day I discovered the wretched creature on the floor smashed flat. I believe some one must have trodden on it accidentally. I was rather disappointed, as I had wished to try and keep the wild pigeon with my tames ones, and see if he would become domesticated.

Rather an interesting fact, in my opinion, is, that while a pair of Pigeons are sitting, the male bird always stays on the eggs during the day-time, and the female through the night, from about 5 in the afternoon. By this arrangement the 'paterfamilias' certainly has the hardest work, as it must be rather trying to stay in all day when you might be out and enjoying yourself. His partner, on the other hand, merely has to sleep in the nest instead of on a beam or elsewhere, and is at liberty all day. Of course the old gentleman has about 5 minutes or so for his dinner, but that is all. Young Pigeons grow wonderfully fast when they have been out of the shell a day or two, and in about three weeks they begin to move about and just fly short distances. But their powers of getting food for themselves do not come on so fast, for they can fly pretty well a considerable time before they can feed themselves. While they are in the nest both the old birds feed them alike, and not as sparrows and other birds do, by bringing them a beak-full at a time, but they produce it from their crops, and make a very peculiar noise in the performance. When the young ones are out of the nest, they are constantly troubling their parents to feed them, and while being fed flutter their wings, and seem just as if they were coaxing or thanking the old birds, as with one of their wings they keep patting them on the back.

As soon as they have reared one pair of young ones, even before they have left them to get their own food, the old Piegons again lay, (in the same nest), sit, hatch, and go through the same course as I have described, and this they do through more than half the year, so that they have several families at the end of the season, and sometimes children's children.

The reason for keeping 'Tumblers' in preference to other kinds of Pigeons is, of course, the pleasure of watching them. When the young ones can fly pretty well then is the best time for getting them all into training, as they seem to enjoy exercise then, but as they grow older, unless kept up to the mark by being flown regularly every day, they relapse into lazy habits. They look very pretty when they fly well together, and keep tumbling over and over, especially if they are up high in the air. The young ones do not attempt to tumble until they can fly as well as the old ones, and they practise by themselves frequently. I saw a pigeon once, it was not my own, that used to thow himself over and over so many times and so fast that he could not always stop himself, and one day he suddenly found himself on the ground, when he no doubt thought he was high up in the air. He hurt himself rather, and lost a considerable amount of feathers by his fall. That was the only instance that I ever saw of a Pigeon not being able to stop while tumbling, for most of them do it with the greatest ease, apparently. Tumblers should never be mixed with other pigeons, as they try and keep up with them when flying, and to enable them to do this they must stop tumbling almost altogether.



F. Madan

REPORT

OF THE

MARLBOROUGH COLLEGE

Natural History Society,

FOR THE

HALF-YEAR,

ENDING CHRISTMAS, 1868.

"Tum mihi Naturæ Libeat perdiscere mores:
Quis Deus hanc mundi temperet arte domum."

MARLBOROUGH:
PRINTED BY C. PERKINS, TIMES OFFICE.
1869.

D. 28.12.88

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PREFACE.

One of the soundest and most encouraging points in the progress of our Society, is the extent to which donations continue to flow in to the Museum. On a later page a complete list of such contributions during the past half-year will be found. It will be enough here to remark with pleasure on the kind interest which has been displayed towards the Society by some of our neighbours in the town of Marlborough. Mr. Baverstock, in August last, presented us with an enlarged photograph of the President, of remarkable excellence and fidelity. We have also received presents from Mr. Parker, Mr. Hawkins, Mr. Gauntlett, and Mr. Chivers, the latter giving a curious silver plate, of Chinese workmanship, probably an honorary badge conferred on a soldier by the Mandarin of his district.* Our special thanks are also due to the following donors beyond the limits of the Society, Rev. A. Butler (late Head Master of Haileybury), Rev. C. Soames, Dr. Walker, Mr. Dixon, and Dr. C. W. Elwes, who has kindly sent several contributions of interest.

Notices of all kinds that the season and the weather have permitted have been quite up to the average of vigour and interest, and the attendance at the fortnightly meetings, taking the half-year throughout, has been satisfactory.

It has been brought as a charge against our proceedings that the Report contains more papers by outsiders or by Hon. Members, than by

* This plate was sent for explanation to Rev. G. E. Moule, B.A., of Ningpo, in China, at present making a stay in England, who kindly sent a full account of the inscription.

actual members of the Society. In reply to this we may observe, that actual members have borne, and bear, their full share of work in this department. It scarcely requires explanation, however, that for the purposes of our report the most interesting and comprehensive papers have to be selected, and that these naturally come, in many cases, from the maturer hands of those who are kind enough to assist us from outside or from the honorary list.

Remarkable vigour has been shewn throughout the past half-year by the Geological Section. During the fine summer weather at its commencement, Mr. Dixon kindly undertook two interesting excursions, one to Oare Hill, from whence the denudation of Pewsey Vale and some tertiary patches were pointed out, and the other to the Valley of Stones. F. Giles is now the head of this Section, as G. E. Manisty has undertaken the duties of Secretary. The loss of E. im Thurn has been severely felt in the Ornithological Section, where his services had been extremely useful.

This is the proper place to call attention to the fact that the honorary list, originally confined to Masters, is now open to any Old Marlburians who feel inclined to join it on the usual terms. It is hoped that we thus may secure the co-operation of some former members of the School who left before the Society had come into play.

The President, besides his weekly lectures on Botany, has been lecturing certain Forms in the Upper School on Botany and Physiology. In connection with the latter lecture, which has been received with very marked interest, the President is also forming a Physiological Museum adjoining Mr. Macdonald's Class Room in the Old House. Contributions to this collection would be gladly received by Mr. Preston. We are sure that this kind of movement will be hailed with satisfaction by anyone who is interested in the sound progress of Natural knowledge amongst us.

LIST OF MEMBERS.

President:

REV. T. A. PRESTON.

Secretary:

G. E. MANISTY.

Treasurer:

REV. T. A. PRESTON.

Librarian:

E. ALMACK.

Committee:

THE EX-OFFICIO MEMBERS.
F. GILES.
C. M. BULL, ESQ.
W. D. FENNING.

Honorary Members:

THE REV. THE MASTER.
A. ARMSTRONG, ESQ.
H. M. MOULE, ESQ.
W. E. MULLINS, ESQ.
F. E. THOMPSON, ESQ.
C. M. BULL, ESQ.
REV. J. F. BRIGHT.
REV. J. SOWERBY.
REV. H. BELL.
REV. C. W. TAYLER.
A. BABINGTON, ESQ.
W. FERGUS, ESQ., M.D.
E. J. TURNER, ESQ.
S. B. DIXON, ESQ., JUN.
W. H. MACDONALD, ESQ.
F. STORR, ESQ.
J. F. DUTHIE, ESQ.
G. H. DAWSON, ESQ.
S. IMAGE, ESQ.
A. C. ALMACK, ESQ.
E. F. IM THURN, ESQ.
G. K. MILLS, ESQ.
F. BONNEY, ESQ.
T. R. DUMERGUE, ESQ.

Members:

F. J. H. JENKINSON.
A. C. HILTON.
H. M. HILTON.
E. ALMACK.
J. B. OAKELEY.
P. G. YOUNG.
W. G. DE JERSEY.
F. J. C. BOLES.
J. B. FULLER.
M. H. SMITH.
G. E. MANISTY.
M. H. SOAMES.
H. MANDERS.
A. H. B. REYNARDSON.
J. S. WOODHOUSE.
E. C. SEWELL.
C. A. SLADEN.
E. L. HESKETH.
B. J. GUILLEMARD.
H. S. SANKEY.
C. F. HARRISON.
T. W. E. HARVEY.
W. D. FENNING.
L. C. CALLEY.
A. DE B. HOVELL.
H. J. VERRALL.
P. L. HESKETH.
J. W. HOCKIN.
F. GILES.
E. H. WYATT.
H. R. ARMSTRONG.
C. J. IRWIN.
A. C. BLAKER.
J. F. CORNISH.

RULES.

1.—That this Society be called the Marlborough College Natural History Society.

Constitution.

2.—That the Society consist of Members and Honorary Members.

Officers.

3.—That the officers of the Society consist of a President, Secretary, Treasurer, and Librarian, to be elected from and by Members of the Society.

Management.

4.—That the affairs of the Society be conducted by a Committee, consisting of the President, Secretary, and three other members of the Society, to be elected from and by Members of the Society; three of whom shall form a Quorum.

President.

5.—That in case of an equality of votes, the President shall have a double or casting vote.

6.—That in the absence of the President, the Committee be empowered to request any member of the Society to take the chair.

Committee.

7.—That on the occurrence of any election, each member of the Committee have double the number of votes of any other Member of the Society.

8.—That two Members be appointed half-yearly by the Society, to assist the Secretary in Editing the Report.

Secretary.

9.—That the duties of the Secretary be to keep a list of all the Members of the Society, and of all former Members and Benefactors who may wish to receive the Reports of the Society; to summon meetings (when necessary) of the Society; to keep a detailed report of the proceedings, as well as lists of Members and Visitors present at each meeting, and generally to act under the direction of the Committee in all matters connected with the welfare of the Society.

10.—That in the absence of the Secretary from any meeting of the Society, minutes of the proceedings be taken by a member of the Committee, appointed by the President.

Treasurer.

11.—That the duties of the Treasurer be to collect all sums of money due to the Society; to receive all donations of money; and to disburse all sums payable by the Society out of the funds entrusted to him.

12.—That the Treasurer furnish half-yearly a detailed account of the receipts and disbursements to be audited by the Committee.

13.—That the funds of the Society be placed in the College Bank, and that no money be withdrawn by the Treasurer without the signature of the President to the order, or in his absence that of the Secretary.

Librarian.

14.—That the duties of the Librarian be to keep a catalogue of the Library, with the names of the donors; to see that the Library Regulations are carried into effect; to be responsible for the order of the Museum, and when necessary to assist the Secretary in the distribution of the Reports of the Society.

Library.

15.—That any Member of the Society be at liberty to consult any of the books belonging to the Society, but that only certain volumes, to be decided on by the Committee, be allowed to be taken from the room.

16.—That if any Member wishes to take a volume from the Museum, he shall give his name, and the name of the book, to the Librarian, who shall enter them in the book kept for the purpose.

17.—That every volume so taken out be returned by the end of the quarter, but that no book be kept more than one month.

18.—That if any volume be damaged, such damage shall be reported by the Librarian to the Committee, who shall decide upon any further proceeding in the matter.

Museum.

19.—That any member of a section, who is not a Member of the Society, be allowed access to the Museum at such times as it is open to members of the Society generally, provided he first obtain leave from the President, which leave shall be renewed every quarter, but may be taken away at any time if the privileges be abused in any manner.

20.—That the same privileges be extended, under the same conditions, to such other Members of the School who may wish to use the Library and Collections for the purposes of study, provided there be a reasonable excuse for their not belonging to a section.

21.—That in all cases the Museum be used for the study of Natural History alone, and not as an ordinary Reading Room.

Members.

22.—That the election of new Members rest entirely with the Committee.

23.—That every Member pay a half-yearly subscription of 2*s.* 6*d.*, to be paid at the first meeting of the Society in that half-year.

24.—That if a member be elected at, or after the Quarter, he shall only pay 1*s.* on Election.

25.—That Members have the right to be present, to state their opinions, and to vote at all general meetings of the Society; to introduce a visitor at general meetings of the Society; to have personal access to, and to introduce a visitor to the Museum; and to have a copy of the report half-yearly.

Visitors.

26.—That on such occasions when the number of those who wish to be present as Visitors at the general meetings of the Society is greater than the number of members who attend, the President and Committee shall be empowered to admit two or more each, as shall seem fit.

Honorary Members.

27.—That Honorary Members have all the privileges of Members, except the power of introducing a member of the School to the meetings of the Society.

Suspension of Members.

28.—That any member be liable to be excluded from the Society by the Committee if, in their opinion, he shall have failed to show sufficient energy in the working of the Society.

Sections.

29.—That sections be formed for the more accurate study of the different branches of Natural History, and that the Heads of these sections be chosen by the Committee half-yearly from Members of the Society.

30.—That these sections shall hold meetings as often as shall seem fit to the Heads of the several sections, at which any member of the School, with the sanction of the Head of that section, may attend.

Meetings.

31.—That ordinary meetings of the Society be held once a fortnight, but that the Secretary be empowered to call extraordinary meetings when necessary.

New Rules.

32.—That any Member of the Society have power to propose any new rule or any alteration in an old one, provided the motion be seconded by another Member.

MEETING HELD AUGUST 21ST, 1868.

THE following donations were announced, and thanks ordered to be given to the Donors:—

A specimen of Apatite, by S. B. Dixon, Esq.

A Swiss specimen of the Queen of Spain Fritillary *(H. Lathonia)*, by Rev. A. Butler.

A box of moths, by A. Marshall.

Three Quail's eggs, by T. Tilleard.

A specimen of Bee-eater from Spain, by E. S. Preston.

A collection of about 70 Coins, mostly Roman, by E. C. Sewell.

Another collection of about 50 Coins, by C. E. G. Crawford.

An Indian gold rupee, by C. A. Harrison.

EXHIBITIONS.

Geology.—Calamite from the Coal-measures by E. Almack.

A piece of Shakspeare's Cliff, by H. M. Hilton.

Entomology.—A box of moths collected by himself, by H. M. Hilton.

A series of varieties of *Cosmia Trapezina*, by A. C. Hilton.

Ornithology.—A Nightingale's nest from Bucks, by E. Almack.

An Indian Jay, by J. B. Oakeley.

A collection of eggs sent by Mr. Baker of Cambridge.

Archæology.—A collection of English Coins, by H. S. Sankey.

Botany.—Specimens of hemp and *Hordeum Pratense* (new to the List), by the President.

A vote of thanks to Mr. Baverstock for his presentation to the Society of the President's portrait was proposed and unanimously carried.

F. Giles was elected a Member.

There were 66 persons present: 4 Honorary Members, 25 Members, and 37 Visitors.

MEETING HELD SEPTEMBER 4TH, 1868.

THE following donations were announced, and thanks ordered to be given to the Donors:—

Several Eocene fossils from Bognor, by F. Giles.

A Chinese silver medal, by Mr. Chivers of Marlborough.

The jaw of a young Shark, by Mr. Hawkins.

White's "Natural History of Selborne," by F. Madan.

EXHIBITIONS.

Geology.—A species of Ammonite from the Lias, by E. Almack.

Entomology.—A box of moths, captured by himself, by H. M. Hilton, who passed round a list of notices for August.

A Convolvulus Hawk-moth, *(S. Convolvuli)*, by the President.

A Hornet's nest, by E. im Thurn.

Archæology.—A piece of Roman pavement from Chedworth, by E. C. Sewell.

An ancient Roman lamp, and a monk's arm-bone from the convent of the Capucini, at Rome, by F. Storr, Esq.

Botany.—A living specimen of the New Holland Pitcher-plant, *(Cephalotus follicularis)* by E. im Thurn.

Zoology.—Two teeth of a Spermaceti Whale, lent by Mr. Hawkins.

A hare's head, in which the teeth were greatly malformed, by the President.

F. STORR, ESQ., read the following paper on the

METAMORPHOSIS OF PLANTS.

THE word Metamorphosis will be familiar to most of you, though the connection in which it is used may sound strange to many. Some of you may remember Proteus' complaint in the "Two Gentlemen of Verona,"

"Thou Julia, thou hast metamorphosed me,
Made me neglect my studies, lose my time."

(a result which it is to be hoped will not follow from our study of Natural History to-night).

All of you have heard of, if you have not read, the Metamorphoses of Ovid, the loves of Apollo and Daphne, of Tereus and Philomel, of Pan and Syrinx,

"How down Mænalus
I pursued a maiden and grasped a reid,
Gods and men, we are all deluded thus."

The changes I have to tell you of to-night are not less wonderful though they rest on better evidence, in fact the evidence of your own senses, as I hope to show you before I have done. But before I proceed to my subject, it may not be out of place to ask you a question, the answer to which is not so obvious as at first sight it seems. Why do you disbelieve such stories? Oh, you will say, no one ever did believe them. Take another case then. Sir John Mandeville, by all reports a very honest gentlemen, tells us that in his travels he came across a nation who were blessed with very broad feet, so broad that they used them for parasols and sat under their shadow, for it was a hot climate they lived in. No one believes this now-a-days; and yet when Mr. Lewes tells of polypi who can turn themselves inside out, convert their backs into stomachs, and live on very comfortably, we are content to take his word for it. Why do we believe the one story and reject the other? What

is our test of credibility? Is it not this—the uniformity of Nature, uniformity subject it is true to endless variety, but varying only within certain limits and subject to certain unvarying laws.

To return to our subject: the word metamorphosis in its technical sense is, strictly speaking, confined to the animal kingdom. It is first used by Henry to express the various changes the animal undergoes in its developement from the fœtus to the adult. Just in the same way the entomologist applies it to the various changes of the insect from grub to chrysalis, and from chrysalis to imago.

The conception you must form of the metamorphosis of plants is slightly different to this. The leaf does not change into pistil and petal, nor does the pistil in its turn produce the leaf. That would be Metamorphosis in the proper sense of the word: rather we must represent to ourselves the whole plant as a series of repetitions of the same type variously modified, and that type we have agreed to call the leaf.

Such is a bare statement of the theory which has received the name of Metamorphosis of plants. Strange as it may appear to you, calyx, corolla, bud, stamens, pistil, differing as they do in colour, form, and consistency, are but modifications of one type, variously dispersed, a very Proteus we may call it, but always like Proteus (if we possess the proper charm), reducible to the original type, which type is the leaf. Before proceeding to discuss in order the various parts of the plant, I will take one instance of Metamorphosis with which you are all familiar, which you have seen a thousand times, though I dare say none of you has ever paid attention to it, or thought of asking himself the explanation of it. You all know a garden rose, you most of you know that it is the same plant as the hedge rose, only modified by cultivation, you can tell me in terms more or less vague the difference between the two flowers. But I doubt whether any of you, if he has not read modern books of botany, can describe exactly what has taken place to turn a dog-rose into a cabbage-rose. Now put the two side by side, you will see that the dog-rose, has 5 petals, and an indefinite number of stamens, the cabbage-rose has an indefinite number of petals and comparatively few stamens, sometimes none at all. Is not the natural conclusion this, the petals have been *transformed* into stamens?

This is what is called by Botanists irregular Metamorphosis, an anomaly produced by cultivation, a retrograde step, so to speak; the usual order has been reversed. But it is from these *lusus naturæ*, these freaks of nature, that we gain the clue by which to trace her regular method of operation. From the exception we learn the rule, just as the physician by studying disease arrives at the laws of health.

We will now examine the *regular* Metamorphosis as it proceeds from the seed to the perfect flower. When a seed begins to germinate, the first organ

of its upward growth assumes very various forms, but they all have received the common name of *cotyledons* or seed-leaves. When below ground, they are thick and fleshy, but when appearing above ground, they are flatter and greenish, and in some plants, as the lime and sycamore, bear a close resemblance to the leaf. On being exposed to light and air their surface assumes a deeper green, is intersected with veins, and approaches more and more closely to the true leaf. They appear in pairs or, if more than two, start from a common axis, whereas the subsequent leaves are oftener alternate.

The *first leaves* of the plant differ from the cotyledons in their flatness and delicate texture, but they are still imperfect as compared with the upper leaves of the plant; at each successive stage the midrib lengthens, and the leaf itself becomes more deeply notched and indented. Nor are we at a loss to discover the means by which this elaboration is effected. It is due to the chemical action of those omnipresent agents light and air. The cotyledons are charged with a crude kind of sap, and this is gradually rarified and sublimated in the upward progress of the plant. We have a curious proof of this in the leaves of the water-ranunculus and other aquatic plants. Some of these are found beneath the water, and these are capillaceous, hair-like or stringy, like sea-weed, others exposed to the sun and air are broad and have their veins connected like other leaves.

George Stephenson was once staying with Sir Robert Peel, at his seat near Tamworth. "What is it," asked the engineer, as they watched an express train flying past, "that's driving that train?" "One of your black drivers I suppose," said Sir Robert. "No." "Steam, then, I suppose you mean." "No, try again." "I give it up." "It's bottled sunlight" said Stephenson. And so it was, it was by the chemical action of the sun's rays that the tree had elaborated that carbon which had for centuries lain dormant in the bowels of the earth, till it was dug up and converted into active force and set to turn the wheels of that wonderful mechanism which Stephenson himself invented.

But like Jack the Giant-killer we must make haste and mount our bean stalk till we reach the blossom. How soon that will be, depends on the amount of nourishment the plant receives, and this stage may be indefinitely accelerated or retarded. For no blossom can be formed till the crude juices have been carried off and the sap sufficiently elaborated.

When this condition is attained, the stem begins to taper, shoots rapidly upwards from the node at which the last leaves were formed, and developes simultaneously a whorl of leaves round an axis, called by the collective name of calyx; the separate leaves which form it are called sepals. That these are leaves, the same organs in fact as those whose formation we have been observing on the stem, is a fact which admits of the clearest proof. It is true that, unlike the stem leaves, they are collected round a common centre, but this phenomenon we have witnessed already in the cotyledons. The only other

remarkable difference is that they are more or less closely united together. But it is a well known law that organs in close contiguity have a constant tendency to cohere, and we may observe in different plants or sometimes in different specimens, the subtle gradations by which the polysepalous passes into the monosepalous calyx. You may observe, too, in many plants two or more small leaves under the calyx, and differing only in size from the regular stem leaves. So, too, the common calyx or *involucre* of composite flowers, such as the Marigold, presents a striking example of the gradual transition from leaf to sepal. Some flowers again, as the Pink, have a second outside calyx, called the *epicalyx*, a sort of preliminary attempt of Nature at the regular calyx.

We have seen how the calyx is produced by the contraction and compression of the leaves; by a similar process the next whorl is formed immediately inside the first, differing still further in colour and texture from the ordinary leaf. One might almost compare the calyx to a rude pipe from which the corolla like a rainbow-coloured bubble—

"Mille trahens varios adverso sole colores"

is blown. Yet even here the close resemblance between a petal and a leaf is so well marked that no one would dispute it when it had once been pointed out to him. The separate parts of each, midrib, claw and petiole, blade and lamina, whether called by the same or distinctive names, all are strictly analogous. And, as in the calyx, there is no lack of witness in which we may mark the transition not fully completed or only just begun. You may often notice half-way up the stem of the tulip coloured leaves, petals, as it were, born before their time. The petals of the white water lily are of a deep green on the outside, while the inner side is a pinkish white, an evident approximation to the colour of the petals.

So far you will have had no difficulty in following me, the connection between the different parts has been comparatively simple and obvious. The next step, as I hope to prove to you, rests on no less satisfactory evidence, but it is not so conspicuous, it will require a greater stretch of the imagination, or, more strictly speaking, of the reason, to grasp it. Nothing less like a leaf at first sight than those sticks with a knob at the top which form the next whorl of the flower. But look a little closer. Observe that the stamen, like the leaf, consists of two parts, the lower part is thin and stalk-like, the upper part is thickened and divided into two lobes, separated by a connective. It is in fact a leaf with the petiole (in this case called the filament) lengthened out, and the blade (now called the anther) contracted and thickened. This is what analogy would lead us to expect, but it is placed beyond all doubt by what happens in abnormal cases or monstrosities, as they are called by Botanists. You are closely acquainted with one familiar instance, the rose, in which the stamens are all, or part of them, transformed into perfect petals. Seize the first opportunity you can of observing any quantity of roses. If

you are fortunate, you will discover specimens in which the conversion is only partial, you will find among perfect coloured petals others which are contracted both in the middle and at the sides, at the end of others you will observe protuberances more or less resembling a perfect anther. In the common water-lily you will find it often impossible to determine where the petals end and the stamens begin, so subtle are the gradations by which one passes into the other.

When all the stamens are changed into petals, the flower is barren, but if, as often happens, any stamens are developed whilst the process by which the flower becomes double is going forward, fertilization may take place.

We have now reached the last series of flower leaves which occupy the centre of the flower. This is called the pistil. It is sometimes single, sometimes consists of a number of styles, either separate or united. The similarity between them and the stamens is so obvious that I may pass quickly over this stage. In many instances the style has almost the appearance of a filament without an anther, in others, as the Iris, the style closely resembles a petal. It is within the developed pistil, as you all know, that the seeds are formed. A pea or bean pod is nothing but a ripened pistil, the pod is nothing but a leaf welded together at its edges so as to form a receptacle for the seeds. In other instances, as the buttercup, the ovary is compound. Here a number of leaves have been folded up separately and each of them holds its seed. In this organ, too, similar monstrosities occur showing its true nature. The capsule of the pink is often transformed into a true calyx, and little remnants of styles and stigmas may be observed attached to the tips of this division. In the family of Ferns the seeds are left unprotected, being arranged in rows on the backs of the leaflets.

The seed itself assumes a multitude of different forms ; in no organ of the plant is there greater variety. But in each case the outer covering is nothing but a transformed leaf, variously adapted so as to form a complete envelope for the germ. I have not time to go through instances, but I recommend all of you who are interested in the subject to take some common fruit—hips and haws, apples, blackberries, and try and make out for yourselves, from what part or parts of the flower the fruit results. There cannot be a more instructive exercise than this, or one which will better show you the wonderful developements and changes which the various organs undergo.

We began with the seed, and we have come back to the seed again. The circle is complete, we have traced the plant through all its developements. There is one organ, however, which I purposely omitted in its proper place, as not forming an internal portion of the flower like the other parts which we have considered. But this organ presents too striking an exemplification of our theory to be entirely passed over. The nectary is that part of the flower which contains a honey-like secretion. Its form and position are most

various, sometimes it is a simple gland, sometimes a lobe of the disk, sometimes a spur; but it may generally be considered as a transitional stage between the petals and stamens, that is its usual position; sometimes it resembles a filament without an anther, sometimes an anther without a filament, sometimes, as in the orchids, it is an elongated petal, attaining in some instances nearly a foot in length.

Some of you may wish to know what is the relation of the bud to the plant. Is it a leaf or a collection of leaves? Not exactly. A bud is an embryo plant, a distinct little plant in itself. There are two distinct processes of vegetable reproduction, the usual process with which you are already acquainted, and, alternating with this or proceeding simultaneously, the multiplication by buds. Each bud is an individual plant, it may be transferred to another plant by the familiar operation of budding, or it may establish a separate existence of its own, as when propagation is effected by slips or cuttings. A bud requires no cotyledons because it is connected with and draws its nourishment from the parent plant. In lower organizations the difference between buds and seeds is imperceptible. So in those wonderful elementary forms of vegetation, the Protophytes, which occupy as it were the borderland between the animal and vegetable kingdoms, multiplication is effected by duplication and subdivision. The original little globule or cell contracts like an hour-glass; others divide into two, as though a plant were to shed its buds, and from these buds there sprang at once plants as fully formed and organized as the mother plant. In the Protococcus, for example, the mystical birth of Athene is effected before our very eyes. Among higher organizations the nearest approach to such a process is to be found in the Hen and Chicken daisy. Here buds are formed in the axils of the leaves of the involucre, which blossom at the same time as the mother flower.

I have said nothing of the stem and root. Whether, as was first thought when this theory was originally propounded, these too ought to be referred to the same type, seems to me very doubtful. It is true that in some instances, as the orange tree and butcher's broom, the stem is flattened out and assumes a very leaf-like appearance. But such cases seem too exceptional to establish a general theory, we shall I imagine gain a truer conception of their character by referring them to a distinct type. Accordingly the plant will bear two typical forms, the leaf and the stem.

Our explanation, so far as it goes, applies only to a single flower growing from a single stalk or scape, a tulip for instance. But from what has been said about buds, it will be seen that the theory holds good for all flowers, whether borne on a succession of pedicels, or on pedicels all springing from one point. All flowers developed from axillary buds are to be regarded as perfect plants. Let us go a step further and consider a composite flower, a daisy or dandelion. There is first a compound calyx or involucre, and within this the

flower produces all its axillary buds simultaneously in the form of flowers placed in the closest proximity. It is as though you drew a stalk through your fingers from the root upwards till you held all the separate flowers pressed together in a thick bunch at the top.

Before concluding I will give you two striking examples of irregular metamorphosis, showing how one organ passes into another, and proving indisputably their common origin, for in Nature's wildest freaks there is always method. Men do not gather grapes of thorns or figs of thistles. In the memoirs of the Paris Linnæan Society is a very interesting account of the Saint Valery apple tree; the flower is quite destitute of stamens and petals, but the calyx is formed of ten sepals in two rows, the pistil is composed of 14 carpels. The owner of the tree saw it in full bloom several years following without bearing any fruit, and was going to cut it down, but a doctor advised him to try fertilizing artificially the pistillate flowers by means of complete flowers gathered from ordinary trees; the experiment succeeded perfectly, and ever since the ladies of St. Valery make a holiday in the month of May, and bring flowers with pollen to the barren tree; each one shakes some over a flower, *Elle fait sa pomme*, as they call it, and attaches a riband to recognize it again. In the autumn the tree is covered with apples differing in size, shape, and colour, according to the variety from which the flower has been plucked, but all the apples present the same peculiarity, the apple has two cores, one in the middle of 5 cells like a common apple, another two-thirds of the way down of nine cells, showing that there are really two apples interfused and welded together. The double calyx shows clearly that there will be two calyx tubes, the 14 carpels, that there is a double ovary, one of 5 (as in the common apple), and one of nine carpels. In this case there has been a metamorphosis of stamens into sepals and carpels.

There is a variety of Rose well known to horticulturists under the name of the Proliferous Rose. As in the ordinary rose the calyx and corolla are arranged regularly round the axis, only the calyx is generally transformed into ordinary stem-leaves, the stamens are fewer in number than in the ordinary rose, but the carpels are abortive and from the centre of the flower the stem ascends again, and on this prolonged axis are developed dark red petals of a smaller size, on some of which are visible traces of anthers; these continue to diminish in size and change at last into stem-leaves: a series of regular nodes is formed and from their axils small imperfect rose-buds burst forth. The explanation of this phenomenon is only conjectural, but it may probably be accounted for thus. Every flower is terminal. The flowering cannot take place till the crude juices first absorbed by the roots have been carried off and the sap sufficiently sublimated and refined. When the flowering has taken place the vegetative force is exhausted and growth ceases.

In the case of the Proliferous Rose it seems as though the flowering period had begun too early. Hence the transformed sepals. The same cause, namely a superabundance of nutritive juices, will account for the abortive carpels. And then the force which would have gone to form the carpels produces instead the prolonged stem. Briefly, the phenonemon may be ascribed to alternate superabundance and exhaustion of the nutritive juices of the plant.

As far as my own defective knowledge and limited time would allow, I have expounded to you the Theory of the Metamorphosis of Plants. But my lecture would be very imperfect if I were not to tell you who was the discoverer of the Theory. No one can have studied, however superficially, the history of the inductive sciences without observing that each discovery belongs more to an age than an individual. Botany is no exception to the rule. The theory of Metamorphosis had been more or less clearly perceived, more or less distinctly enunciated, by many Botanists before the philosopher with whose name it is *par excellence* associated. In particular Wolff and Linnæus deserve honourable mention as precursors of, if not participators in, the discovery. But after all the true discoverer, the man who first grasped the theory as a whole and published it to the world, was without a doubt the great German Goethe. And who was Goethe? A poet, a philosopher, a statesman, anything but a professed Botanist. He took up Botany, just as any of you might take it up, not at the expense of his regular occupations; but as a relaxation; like the great Frenchman Rousseau, he made it the solace of his old age, the amusement of his leisure hour. And what was the method he pursued, by what steps did he attain these splendid results? A very simple method, one we can all of us put into practice—in one word, Patience.

Le génie, says Buffon, *le génie c'est le patience.* But you shall hear Goethe tell the story himself. "For-a-half-a-century," he tells us in the history of his Botanical Studies, "I have been known as a poet in my own country and abroad. No one thinks of refusing me that talent. But it is not generally known, that I have also occupied myself seriously through many years with the physical and physiological phenomena of Nature, observing them with the perseverance which passion alone can give. Thus when my essay on the developement of plants, published nearly forty years before, fixed the attention of Botanists in Switzerland and France, there seemed no expression for the astonishment at the fact of a poet thus going out of his route to make a discovery so important. It is to combat this false notion that I have written the history of my studies, to show that a great part of my life has been devoted to Natural History, for which I had a passion. It is by no sudden and unexpected inspiration of genius, but through long prosecuted studies, that I arrived at my results. I might doubtless have accepted the honour which they wished to pay my sagacity, and in secret rejoiced at it. But as it is equally pernicious in science

to keep exclusively to facts or exclusively to abstract theories, I have deemed it my duty to write, for serious men, the detailed history of my studies." *

Noble words of ripe wisdom, instinct with the very spirit of Natural Philosophy, words which I will not weaken with any comment of my own.

There were 63 persons present; 7 Honorary Members, 26 Members; and 30 Visitors.

MEETING HELD SEPTEMBER 18TH, 1868.

THE following donations were announced, and thanks ordered to be given to the Donors:—

A collection of Roman Coins, by Rev. C. Soames.

Various Coins, by Rev. E. B. Warren, H. R. Armstrong, and A. de B. Hovell.

A large collection of Flint Implements from Yorkshire, by E. C. Scobell, Esq.

Two specimens of the Pale Clouded Yellow *(C. Hyale)*, by J. S. Woodhouse.

A specimen of the Linear Hawk-moth *(D. Livornica)*, by F. E. Thompson, Esq.

A specimen of Sponge from St. Domingo, by Mr. Hawkins.

EXHIBITIONS.

Entomology—A specimen of *C. Hyale*, by H. M. Hilton, who read a list of captures, in which were specimens of *S. Convolvuli* and *D. Livornica*.

Botany—A monstrosity of Lady's Slipper *(C. Calceolus)*, with two spurs, by E. im Thurn.

Specimens of the Fungus *Fistulina hepatica*, by H. R. Armstrong.

The Rev. T. W. Dowding gave a very interesting account of the wilful suffocation of 22 chickens in a tub 15 inches deep, and 22 inches across.

E. H. Wyatt and H. R. Armstrong were elected Members.

F. E. Thompson, Esq., read the following Paper, entitled

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* Lewes' Life of Goethe. From this work and Goethe's Metamorphoses der Pflanzen the principal materials for this lecture have been drawn.

A SHORT ACCOUNT OF THE FOOD COLLECTION AT THE SOUTH KENSINGTON MUSEUM.

Most of you know by experience the unsatisfactory nature of the enjoyment derived from going over or "doing" a Museum. The day for the ceremony is probably fixed some time in advance. Speculation is rife, and anticipation on tiptoe. On such a day "we are going to the British Museum." The fatal hour arrives. The family moves off. It enters the great hall, and the different members, aimless, and methodless, drift through the weary and unintelligible saloons. At first mind and body, braced by self-deceptive expectation, bear up against the distraction, and the consciousness that we do not know what we are there for. But we are carried in through the Græco-Roman gallery: "There's Faustina!" "Who's Faustina?" Into the Lycian hall—"Ah No. 136, Frieze, representing a dance of Satyrs, what a queer thing!" To the great Egyptian gallery where, perhaps, a sarcophagus or a pophyry cat catches our eyes—the famous Rosetta stone is there, but we neither notice it, nor know anything about it: and so we float upstairs past the Gorilla, and the Greek vases, and the mummies and the South Sea islanders, the stuffed animals (how fusty they are!), and the Saurians, gazing at all things, but marking nothing, until at last fairly exhausted, disappointed, and ill-tempered the family collapses, or, happy thought! seeks refuge in the real business of the day, the refreshment room. Then possibly after one or two more ill-spent hours we return and with the elasticity of hypocrisy every body declares how delightful a day has been spent, and how instructive!

Yes, very satisfactory to have wasted a whole yesterday and to salve ourselves all round with an unctuous fib to-day.*

In my present paper I wish, while describing a Museum, to indicate *how* it should be visited.

Most of you know something of the South Kensington Museum—It contains many departments of science and art, all beautiful and delightful, among them the Food Collection. I cannot see everything in one day, I go therefore to one room, or one subject, and try to see that well. Such a course, I find by experience, yields the maximum of pleasure and profit with the minimum of aggravation. I enter the Food Museum. There I see an array of glass cases filled with different objects. The walls above are hung with explanatory diagrams, and tabular forms. At first I can make neither head nor tail of the

* The writer is very much indebted to Dr. Lankester's Lectures on Food, published by Hardwicke, Piccadilly. The paper is chiefly the result of very many visits to the Museum.

place. I must once for all beg you to excuse the iteration of the first personal pronoun, and to understand it as a strictly impersonal formula. I enquire of a policeman which is the head, and which the tail, avoiding however metaphorical language. Then I begin. In front is a large table informing me of the constituents of the human body. To this is added a note explaining that the body is subject to constant waste, which waste must be constantly made good. Here then is the text of our alimentary sermon. Here is a rough definition of food. Food is the material for replenishing the waste of the body. Other tables classify the constituents. The human frame loses its moisture, its mineral matter, its heat, its muscles. Food therefore must supply water, minerals, carbon, and nitrogen. So the Museum is arranged according to the nature of the food essential or auxiliary to the preservation of the body in all its nice complexity.

It is quite beyond my present purpose to attempt anything like an exhaustive description of the Collection. I shall merely try to classify the constituents of the human body, and the different kinds of food which supply the loss of those constituents. I shall then notice briefly one or two of the more out-of-the-way products to be seen in the Museum.

At the beginning of the Collection you will see two large tabular forms giving, one the *ultimate*, another the *proximate* elements of the body. Like the Conjuror before he shows his tricks, might I ask some person present, weighing about 11 stone, to lend himself for a few moments, his body I mean, not for analytical, but simply for illustrative purposes?

(A volunteer of suitable bulk comes forward.)

Here then is an organism weighing 154 lbs. or thereabouts. If we break up this "piece of work" we shall find that it consists in the first place of the elements contained in Table I.*

TABLE I.

Ultimate Elements of the Human Body.

	Lbs.	*oz.*	*grs.*
1.—Oxygen, a gas. The quantity contained in the body would occupy a space equal to 750 cubic feet	111	0	0
2.—Hydrogen, a gas. The lightest body in nature. The quantity present would occupy about 3,000 cubic feet...	14	0	0
3.—Carbon, a solid Animal Charcoal	21	0	0
4.—Nitrogen, a gas. It would occupy about 20 cubic feet when free	3	9	0
5.—Phosphorus, an inflammable solid	1	12	190
6.—Calcium, a solid, the metallic Base of Lime	2	0	0
7.—Sulphur, a solid	0	2	219

* The tables are copied from the South Kensington Museum.

	Lbs.	oz.	grs.
8.—Fluorine, a gas. It is found united with Calcium in the bones	0	2	0
9.—Chlorine, a gas. Combined with sodium it forms common salt	0	2	382
10.—Sodium, a metal. It floats on water	0	2	116
11.—Iron, a metal	0	0	100
12.—Potassium, a metal. It floats on water, and burns when placed on it	0	0	290
13.—Magnesium, a metal	0	0	12
14.—Silicon, a metallic substance. It is found on the hair and teeth	0	0	2
	154	0	0

The substances in the above table are incapable of further separation. This is all the 154 lbs. before us consists of, leaving the soul out of the question, as confessedly immaterial. These elements, however, when combined, form a set of compound bodies called Proximate Principles, out of which tissues and fluids are formed. You will find them in Table II.

TABLE II.

Proximate Principles of the Human Body.

	Lbs.	oz.	grs.
1.—Water, oxygen and hydrogen mixed	111	0	0
2.—Gelatin, of which the walls of the cells and many tissues of the body, as skin and bones, are principally composed	15	0	0
3.—Fat	12	0	0
4.—Phosphate of lime, the principal part of the earthy matter of the bones	5	13	0
5.—Carbonate of lime, also entering into the composition of the bones	1	0	0
6.—Albumen, in the blood and nerves	4	3	0
7.—Fibrine, forming the muscles, and the clot and globules of the blood...	4	4	0
8.—Fluorine of calcium, in the bones	0	3	0
9.—Chloride of sodium, common salt	0	3	370
10.—Sulphate of soda	0	1	170
11.—Carbonate of soda	0	1	72
12.—Phosphate of soda	0	0	400
13.—Sulphate of potash	0	0	400
14.—Peroxide of iron	0	0	150
15.—Phosphate of potash	0	0	100

	Lbs.	*oz.*	*grs.*
16.—Phosphate of magnesia	0	0	75
17.—Silica...	0	0	3
18.—Chloride of potassium...	0	0	10
	154	0	0

Two cases in the Museum contain these substances, one the ultimate, the other the proximate elements. Here in Case 1 is a philosopher labelled in fourteen bottles. Case II contains the Proximate elements of "Imperial Cæsar" if you will—a tank holding 111 lbs. of water, a pile of gelatine looking like a stack of parlour hurdles, a big lump of fat, and a number of saucers and phials filled with phosphates and salts.

We can thus, you see, break up the human frame, but we cannot put it together again. Even a Frankenstein is with us an impossibility, man can destroy, God only can create :—

"When I have plucked the rose,
I cannot give it vital growth again,
It needs must wither."

But food saves from destruction. Food is the constant repair of constant loss.

We have not yet, however, arrived at a classification of waste, or of food. If you refer to Table III below you will see that food is divided into two great classes, and seven groups. Food is either Alimentary or Necessary, Class I, or Medicinal, Class II.

TABLE III.

Classification of Food.

CLASS I.—ALIMENTARY OR NECESSARY.

Group 1.—Mineral :

a. Water ;
b. Salt ;
c. Ashes of Plants and Animals.

Group 2.—Carbonaceous or Respiratory—Heat giving :

a. Starch ;
b. Sugar ;
c. Fat.

Group 3.—Nitrogenous or Nutritious—Flesh-forming :

a. Albumen ;
b. Fibrine ;
c. Caseine.

CLASS II.—MEDICINAL OR AUXILIARY.

Group 1.—Stimulants :

a. Alcohol ;
b. Volatile Oils.

Group 2.—Alteratives :

a. Acids ;
b. Alkaloids.

Group 3.—Narcotics :

a. Tobacco ;
b. Hemp ;
c. Opium.

Group 4.—Accessories :

a. Cellulose ;
b. Gum ;
c. Gelatine.

Now our organism of 154 lbs. contains no less than 111 lbs. of water. Exhaust this water from blood and tissues, and you have a shrivelled mummy weighing only 43lbs. Water therefore is necessary to life. Some plants and animals contain a still larger proportion than man. Thus the cabbage yields 92 per cent of water ! Solid timber yields 30 per cent. Professor Owen found that a jelly fish weighed 2lbs. When the sun had dried the creature it was reduced to 16 grains. Well might the old Ionic philosophers guess that water was the origin of all things..

Continuing our anaylsis we shall next obtain a quantity of gases, and lastly a heap of ashes. "Pulvis et umbra sumus." In these ashes we obtain a variety of mineral substances or salts.

Here then we have the first group of our classification, subdivided into (*a*) Water ; (*b*) Salt ; (*c*) Ashes of plants and animals.

To proceed—The human body, when in health, has a fixed temperature in every climate, near the Poles or under the Equator. If you insert the bulb of a thermometer in any covered part of the body, under the tongue for instance, you will find the mercury rise to 98° or Blood Heat.

"'Tis thus the Mercury of man is fixed."

This heat is generated by the union of carbon in the body with the oxygen of the air, the result being given off in the form of carbonic acid by the organs of respiration. We thus arrive at our second group of Carbonaceous, Respiratory, or Heat-giving food, subdivided into (*a*) Starch ; (*b*) Sugar ; (*c*) Fat.

Again, we perceive and think with the brain, which is nervous matter. We see, hear, taste, touch, and smell by the agency of the nerves ; we act with muscles. Now nervous and muscular tissue contains a further chemical element, nitrogen. A further group therefore is necessary, consisting of nitrogenous, flesh-forming, or nutritious substances providing us with (*a*) Albumen ; (*b*) Fibrine ; (*c*) Caseine.

These three groups contain all that is necessary to life. All other material taken into the body acts like medicine in the way of stimulants, alteratives, narcotics, or accessories.

I can only give a brief account of Class I, with perhaps a glance at some fancy items in Class II.

To begin with *water*. Water enters into the composition of all plants and animals. Plants absorb it, and extract from it the materials of life. Animals drink it, and feed on plants. Thus, at first and second hand, we take water as food. We take it at second hand in a multitude of ways; in tea, coffee, beer, wine; in flour, which contains 14 per cent. of water; in cheese, which contains 40; mutton 44, beef 50, potatoes 75, fish 78, eggs 80, turnips 87, and, from above, cabbages 92.

Let us see what are its uses. When introduced into the system, with the help of the saliva, it dissolves our food, and so renders it digestible. This is its most important operation.

Water, therefore, being so universally employed, it is of the greatest importance that a pure supply be at hand. The purest of all water is rain falling through a clean country atmosphere. Water however for drinking purposes is mainly derived from rivers, springs, and wells. Such waters contract many impurities from the soils through which they pass.

The London water, taken from the clay, is very bright and sparkling. These qualities are due to the decomposition of mineral or vegetable matter. The churchyard pump is invariably the favourite pump. London water is also very cooling. This property no less arises from the formation of salts in decomposing organic matter. As a rule it may be said that the dangerous stage of matter is the putrescent, decomposing, or fermenting stage. When that stage is past new substances may be formed most healthful and essential. Waters also are heavily charged with chemical and mineral matters, with gases and salts. Such are the springs of Bath, Harrogate, and Seltzer. Our Marlborough water holds in solution a considerable amount of chalk, or carbonate of lime. This is the fur which collects inside the familiar kettle, for boiling precipitates the chalk.

The museum then contains a great number of glasses holding unfiltered waters, which reveal to the naked eye, and much more to the microscope, a wondrous collection of animal matter living and dead, of plants, and of minerals. Some jars are perfect vivaria, or rather mortuaria. A cistern of Grand Junction Water, besides fish, snails, reeds, and weeds, reveals ten varieties of microscopic creatures, active and stationary, brown and green sporules, threads of fungus, grit, debris, and earth.

But the museum not only warns us of impurities, it also provides remedies. Close by is an assemblage of filters and tests; of the former the most interesting is "the poor man's filter," constructed in the following very simple manner: a garden pot, the hole plugged not too tightly with a sponge, a layer of charcoal two inches thick, a second layer of clean sand, a third of coarsish gravel. It is a very effective apparatus.

A very pretty test of the presence of organic impurity is also given. Permanganate of soda contains a large quantity of oxygen. When brought into contact with organic substances the permanganate loses its oxygen and its colour. This preparation, known familiarly as Condy's disinfecting fluid, has been poured into about a dozen jars. The purer the water the brighter the colour. There is every variety of hue from a brilliant carmine to an unhealthy whity-pink.

Let us now pass on to the salts we take as food. Referring to Table II., you will see that our bodies contain phosphate of lime in the bones; carbonate of lime, or chalk, also in the bones; phosphate of magnesia in the bones again, and the fluids; chloride of sodium (common salt) in the blood; iron in the blood, gastric juice, hair and eyes: silica in the teeth. Those who attend Mr. Dixon's geological lectures will be interested to trace in the chalk and silica the relation we bear to the rhizopods, and the diatomaceæ. As we moult therefore these materials must be replenished, or we shall inevitably die. It is through neglect of this kind of food, according to Dr. Lankester, that "babies get rickets, young ladies acquire crooked spines, fathers get gouty, and mothers have palpitations."

Salt first. Its analysis shows how two substances destructive to life may combine to form a compound absolutely essential to it. It consists of chlorine, a suffocating gas, and sodium, a metal so inflammable that it must be kept in ~~water~~ naphtha, containing no oxygen.

Salt exists in the blood. We have all cut our fingers, sucked them, and tasted the salt. Next time you cut yourself if you take a drop of blood, place it on a glass, and hold it over a spirit lamp, the water will evaporate and a residuum of rock crystals will be left. I hope however you will not carry your scientific enthusiasm so far as to emulate the worshippers of Baal.

Salt therefore is essential to life. Its uses are very important. First it facilitates the absorption of water into the system; secondly it supplies chlorine to the gastric juice which dissolves our food; thirdly it dissolves our food, and so enables it to pass into the blood, without doing which it would not be food. Salt also preserves meats, vegetables, and fruits. The Museum contains many specimens of rock-salt from the New Red Sandstone of Cheshire; of salt pumped from brine springs; of salted fruits and vegetables.

Our phosphates and salts of potash we get from two sources, animals and plants, from the grasses especially. Animals derive them from plants, plants from minerals.

You have often seen the family cat strolling down the garden at the hour of breakfast, and gathering a refreshing mouthful of grass, eating its salad in fact. Instinct has guided it in this way to avoid rickets for its kittens, palpitations or gout for itself.

But plants again extract these substances from minerals. Where there are no phosphates there are no grain crops. A soil without phosphates means a perishing nation. Baron Liebig's theory of the destruction of the great cities of antiquity, Babylon, Tyre, and others, is that it was due to the disappearance of phosphates. In America where land, for the present, is unlimited, when the farmer has exhausted the soil in the East, he moves westwards. In our own little island necessity has forced us to invent phosphates. Hence our artificial manures.

The main sources of potash are the potato, carrot, radish, watercress, lettuce, and so on, which therefore are essential to life. The potato is connected with an interesting theory. When brought into Europe it was devoured with an instinctive avidity. A Solano-mania seized on the Old World. At the same time black deaths and sweating sicknesses disappeared. Had the potato anything to do with this? Is it the old fallacy of *post hoc propter hoc* to think so? Some scientific men say No, reasoning thus—Potash oxidises, the potato contains potash. It oxidised the unwholesome lazar-like blood of the sixteenth century, and expelled disease.

I pass on to Group 2. The carbon and hydrogen within us combine with the oxygen of the air, and the fire is kindled. The body is the furnace, the mouth the chimney, the breath the smoke. The fuel is food: the stoker is man himself, who usually performs his work cheerfully enough.

Starch consists of carbon and water. Hence its heating power. You must not however fancy that if you bought a pound of grocer's starch on a cold day, and swallowed it you would walk about in a summer heat of your own creation. Carbon itself is indigestible. When taken in the form of starch it must first be fermented, and turned into sugar by the saliva before it can pass into the blood. Starch is found in many plants, especially in such as arrowroot, tapioca, sago, potato, rice, wheat, flour, lichens. The Museum contains several curious varieties of these plants, and their products. There is the Iceland moss. To get at this the reindeer turns up the overlying snow with his nose and so keeps up his internal fire. There is the male orchis from which was made Saloop, which within the last thirty years was sold in the streets of London as a substitute for tea or coffee; the Arctic lichen, called the Tripe de Roche on which many a navigator has had mainly to live; many sea-weeds such as Laver, Dulse, and the Irish moss, a handful of which may be bought any day for a halfpenny in the streets of Cork, and others which Horace thought useful only as furnishing a symbol of uselessness.

Starch can be converted to sugar. Sugar will ferment and yield alcohol. Hence from starchy plants are obtained a vast variety of compounds. I remember some time back a lecture on the Potato by our President, in which he showed some thirty or forty articles formed from this Protean vegetable, starch, arrowroot, sago, sugar, syrup, brandy, champagne, and so on.

There are many specimens of sugar, from the cane, from milk, from the Chinese sugar millet, from the birch, the palm, and many other sources.

Many curious sugar-yielding substances are also shown ; for instance, one sort of manna which exudes from a species of ash, the Fraxinus ornus: another which is secreted by the pupa of an insect of the Psylla family, and gathered from the leaves of an Australian plant, the Eucalyptus Annosa.

You remember how, after Trafalgar, Napoleon tried to ruin British Commerce by excluding it from Continental ports. Cane sugar was thus excluded. But sugar is necessary to life, and Nature is stronger than Napoleon. A German soon invented a process, which the French employed, of extracting sugar from the beet. An old member of the School, a year or two ago, just returned from a West Indian plantation, complained to me that the Beet had nearly ousted the Cane from the European market.

In America and Canada sugar is also obtained in large quantities from the Sugar Maple. The tree is scored, or fluted, and the gum drips down into a pail. Cakes made of it are sold in every railway car. Before leaving Quebec I had a fancy for procuring a small specimen for the Natural History Society. Entering a store I asked the man for one of his smallest cakes. He disappeared and soon returned with a block weighing about 9 lbs, and looking like a corner-stone of Herod's temple.

I must however hasten on. The last sources of heat are fat, oil, and butter. These substances contain less oxygen than starch and sugar, and therefore more carbon. Fat itself is indigestible, but the bile of the liver renders it soluble. Fat protects the cells of the body, and acts as a kind of coal cellar against a cold day, being a bad conductor of heat. Hence the dormouse and hedgehog take in a superflous stock in summer, and sleep during winter. When therefore people waste away, cod liver oil is given them. In cold climates, fat, in some shape or other, is eaten in large quantities. An Esquimaux is said to take 20 lbs. of blubber at a meal. Dr. Lankester tells a good story of some Russian sailors being at one of our seaports during the Great War. The streets were then lighted with oil lamps—one cold night all the lamps went out. It was found that the Russians had swarmed the lamp posts and lapped up the oil.

The last and most important class of food is the nitrogenous, from which are formed the nervous and muscular tissues by the agency of which sensation, perception, thought, and action, are possible. We cannot move our muscles, we cannot listen to nonsense, we cannot think without waste. Hence our hunger after play and work alike, and hence, immoral as the statement sounds, work and play, in a physical sense, are literally identical.

Our friend of 154 lbs. loses one-fortieth of his substance per diem. He is ever changing, ever making good the old axiom of Heracleitus, that all is in a state of flux, *πάντα ῥεῖ*.

These tissues of thought and action contain all the four elements, oxygen, hydrogen, carbon, and nitrogen. Our food must contain them too. As usual the sources are twofold, vegetable and mineral. The ox and the sheep derive them from plants, plants from minerals. Thus we get a new conception of the unity of nature, of the "great chain which drawing all to agree" connects the inanimate rocks with the brain of a Socrates, a Cæsar, and a Shakspere.

Such foods yield the necessary substance in three forms, Albumen, Fibrine, and Caseine. There is a base common to all three modifications.—A plant cell for instance contains a dark eye or nucleus—This nucleus consists of a substance called Proteine, of which Albumen, Fibrine, and Caseine are so many manifestations. The white and yolk of egg consist of albumen—albumen exists in the blood of animals, and in plants. Alcohol coagulates albumen. Hence the intemperate use of ardent spirits renders our food indigestible and useless; and hence the haggardness and wasting away of the drunkard.

Fibrine is in the blood, it is the substance which entangling the red substance forms a clot of blood. It is identical with gluten in plants.

Caseine is the substance in milk from which cheeses are made.

The vegetables which supply us with our chief stock of proteine are the cereals. Oats and barley contain more of this matter, and therefore are more nutritious, than wheat. This is partly why the Scotch are so shrewd. The Museum gives abundant specimens of all kinds of proteine-yielding plants, maize, beans, peas, lentils, buckwheat, &c. Peas and lentils are very nutritious. No wonder therefore Daniel and his three friends at the Court of Babylon continued to be fat and well liking. The fruit of the bread tree (Artocarpus Incisa) from the South Sea Islands is exhibited. Potatoes contain a very small modicum of proteine and therefore are not adapted to serve as a general food. A hard-thinking and hard-working nation can never be a potato-eating nation. To build up nerves and muscles more nitrogenous food is absolutely indispensable.

Lastly with regard to animal nitrogenous food.

Milk is the type of all food. The young of mammals when fed solely on milk develope moisture, heat, tissues, and bones. Milk therefore is all food in itself.

Milk contains a large amount of caseine, and the essence of sugar. From the caseine of milk is made cheese, which contains, odd to say, more nutritious matter than meat. But you may have too much of a good thing. Excess of caseine is indigestible—cheese accordingly is indigestible. Caseine however possesses the unselfish property of decomposing and rendering digestible other matter. Hence cheese after meat, and hence the old rhyme:—

"Cheese is not a sordid elf,
Digesteth all things but itself."

Meat, besides containing Proteine, contains large quantities of gelatine. This gelatine you may be surprised to hear contains absolutely no nutriment whatever. It is useful however, for it forms the scaffolding of cells, and answers to fibrous matter in wood. Just as we give horses chopped straw to render their food digestible, so gelatine and the woody fibre of plants are useful. Careful analyses are given of different meats. Pork contains 10 per cent of nitrogen, lamb 11, mutton 12, beef 15, veal 16.

I have only time left to give you an analysis of one or two articles of food. You ought now to be able to understand the use of their several parts.

Thus 1 lb of figs contains—Water 2 oz., 254 grs.; gluten 420 grs.; sugar 9 ozs., 254 grs.; dextrine (gum) 70 grs.; woody fibre 1 oz., 263 grs.; fat 13 grs.; ashes 140 grs.

1 lb of turnips contains—water 14 ozs., 213 grs.; albumen and caseine 275 grs.: sugar 280 grs.; woody fibre 168 grs.; mineral matter or ashes 35 grs.

1 lb of tea contains—theine 210 grs.; caseine 2 ozs., 175 grs.; aromatic oil 4 ozs., 52 grs.; gum 2 ozs., 385 grs.; sugar 211 grs.; fat 280 grs.; tannic acid 4 ozs., 875 grs.; fibre 3 ozs., 87 grs.; mineral matter 350 grs.

A tea is shown, the flower of Pekoe, which costs fifty shillings a pound in China.

Cocoa in 100 parts contains 51 of fat, 22 of starch and gum, 20 of flesh-forming matter, 2 of theobromine, being far more nitrogenous and heat-giving than any flesh.

There is a case containing food remains from the lacustrine dwellings in Switzerland (lake of Pfäffiken, Zurich). There are carbonized apples, apple seeds, barley, bread, hazel nuts, millet, and waterlily seeds of a species now extinct.

A case of oriental dainties—serpents, sea slugs, ants, glue, fish maws and sharks fins, cockscombs (a favourite dish in the middle ages, and still brought to table in the South of France), and Kow-tow, a favourite Chinese fish, said to eat like mouldy cheese. Japanese sea-weeds, and numerous reptiles such as the Iguana.

I can only recommend you to study the public dietaries of soldiers, sailors, pensioners, paupers, and so on: and if you can stand such a Chamber of Horrors, to examine the collection of articles used to adulterate human food.

I fear I have long since exhausted you, but I have barely glanced at my subject. I earnestly hope I may have tempted some to acquaint themselves with this wonderful and beautiful collection.

Before parting let me answer one or two obvious objections. People will tell you that in choice of food instinct is sufficient, and that knowledge only makes us valetudinarians—with brutes instinct is doubtless fully sufficient, but

with us I cannot understand how knowledge, rightly used, should not minister to our happiness. If it do not it must be so either from some moral imperfection, or some unsuspected deficiency in the knowledge itself.

It is all very well for the young and the wealthy to sneer at efforts to give life and happiness to the infirm and poor. True charity towards them should not tax our purses merely, it will call for the enlightened application of scientific knowledge. That such knowledge has ameliorated sickness and suffering, is demonstrable from the discovery that bad waters have been the cause of pestilence, that gelatine soup diet was killing off the country poor in France, that mortality among children in London was engendered by the use of stale milk.

In the happy epic days of youth, never to return, when the human stomach vies with the stomach of the ostrich, when hot buns, chemically adulterated pickles, and wedges of cake, before, during, and after dinner, interfere seemingly but little with happiness, we may afford to sneer; but those days soon pass away and widening experience teaches us that sufficient and wholesome food means health and activity of mind and body to the individual, energy and prosperity to the nation.

There were 87 persons present—3 honorary Members, 24 Members, and 60 Visitors.

MEETING HELD OCTOBER 2ND, 1868.

THE following donations were announced, and thanks ordered to be given to the Donors:—

A collection of English and Foreign Coins, by C. J. Irwin.

A fine Wasp's Nest, 37 inches in Circumference, by Dr. Fergus.

A collection of Minerals, by the Rev. J. Sowerby.

A Gourd and two Turtle's Heads, by Mr. Hawkins.

A specimen of the Land Crab from India, by Mr. E. Harraway.

EXHIBITIONS.

A Web of the Gossamer Spider, sent by Mr. G. Church, of Ramsbury.

Two plants new to the College List, the Bristly Helminthia (*H.Echioides*) by A. de B. Hovell, and the Stork's-bill (*Erodium Cicutarium*).

A list of Moths taken during September was passed round by H. M. Hilton.

The following resolution was announced :—"That all Old Marlburians be eligible for election as honorary members of the Society, being subject to the ordinary half-yearly subscription of 2s. 6d." In accordance with this resolution J. F. Duthie, Esq., was elected an Honorary Member.

S. Image read the following Paper on

MONUMENTAL BRASSES.

THERE are doubtless some here to-night who will consider I have overstepped the limits of the fields of investigation to which a Natural History Society is ordinarily supposed to confine itself, in introducing to your notice in the present paper the study of Monumental Brasses.

To any such objectors I would once and for all reply that I believe this Society will most clearly vindicate its right to the title it professes, by extending its researches in, and giving its heartiest encouragement to, every branch of nature's handiwork alike, and to what more than to the study of man, her chiefest and noblest creation, and to all that concerns him whether in his natural or civilized condition. There may be, however, another class, who will be ready enough to allow the subject, the study of which I would advocate this evening, a place in the curriculum of our society, provided they can receive any sufficient reason for its introduction, and be shown any real advantage to be derived from its pursuit.

To the fair and honest questions of such gentlemen I would willingly endeavour to give a fair and honest answer: it is half victory to be able to give a reason for your actions.

That an accurate acquaintance with the social, religious, and political conditions of past generations is of infinite value as well as of infinite interest to ourselves appears at the present time so well established a fact, that I need scarcely here do more than point out how its existence is clearly evidenced by the daily increase of our love and respect for all connected with the past, and how we are hourly growing in the appreciation of all that is beautiful, and noble, and worthy in the works those ages have left to us. "A people may for a time under pressure of some violent crisis deny their past, even curse it"—says an able writer of our own day: but that spirit of blind fanaticism, has I hope, for ever past away, yielding place to a nobler and more healthy desire to learn from the past all the good the past can teach us: for apart from the mere interest and satisfaction such a study of bygone generations can afford us, great and valuable as I believe that in itself to be, it is still more valuable as a means of enlarging our morals and experiences, of cultivating our tastes, and of teaching us more or less directly such lessons of respect, humility, and large-heartedness, as we shall all do well to learn.

There are few things which help us more in the study of these past ages, or enable us more vividly to realize their manners and customs, their religious habits and sentiments, than a systematic examination of their

sepulchral remains, where we find them still extant. Among the ancients the dead always received especial honour and respect; nor, as might be naturally expected, when the brighter light of Christianity dawned on the world was that pious care neglected or regarded as unnecessary. It is not, however, my object to-night to give you an account of all the various manners in which this honour was shown to the departed; but rather taking that individual class of sepulchral memorials, which is known by the name of "Monumental Brasses," to roughly sketch out the various interesting particulars connected with that study, in support of which I cannot refrain from quoting the words of an able writer on the subject, who in speaking of the advantages such a pursuit affords to the earnest investigator, remarks: "A careful survey of a series of the monumental brasses of this country would enable one to follow the gradual changes of manners and habits, to track the prominent feelings, and even to detect the religious emotions peculiar to each age; for not only the figure, its attitude and costume, but the inscription, and the subordinate parts of the design, all conspire to furnish a lively picture of the individual and his times."

It is my intention to-night to confine my observations as much as possible to the monumental brasses of our own country: for the subject is one which, if taken most generally and considered in all its direct and indirect associations, might be made so wide and comprehensive, that there would be neither time to speak on, nor perhaps, were that granted, would it be desirable for you in one paper to listen to, the various branch subjects, into which this study almost imperceptibly leads us.

It will be, however, necessary to say *something* about foreign brasses, in order to comprehend clearly, which is most essential, how and when arose the custom of commemorating the deceased by the erection of these monumental effigies, a custom which we find so frequent during part of the thirteenth, the fourteenth, and fifteenth centuries of the Christian era.

The source appears to have been two-fold.

From the 8th to the 12th century there was in vogue a very favourite style of sepulchral memorial, namely the *Incised* or *Engraved* slabs of flat stone, sometimes let into the ground, sometimes, as in an instance from Cornwall, erected to serve as an altar. These incised stones were of two distinct kinds; either the devices were cut into the stone, or else the interstices between the devices were graven out, thus leaving the pattern itself standing out in slight relief with a raised border round to serve at once for a protection and ornament.

We have here then one source from which the later brasses sprung.

The second was undoubtedly the celebrated "*Limoges*" *enamels*. This wonderful branch of art appears to have been introduced from Byzantium somewhere about the beginning of the 11th century, that is to say three

hundred years or so after the earliest recorded instance of the flat incised stones I have just spoken of. This exquisite enamel work called "Limoges" from the town in France at which it was principally manufactured, was, as might be expected, soon found too expensive for any but the most wealthy nobility of the land. Athough therefore it was destined in itself never to be extensively employed for monumental purposes, it nevertheless paved the way for the introduction of the less costly, more durable, and in some respects, scarcely less beautiful species of effigy, namely the Monumental Brass.

From these two sources then we arrive at the actual introduction of the Brass Effigy, as we find specimens still extant in many of our older Churches. The earliest *recorded* specimen I have seen mentioned bears the date 1208. I say recorded, as I believe the earliest, or at any rate, earliest English Brass, remaining at the present day is that of Sir John D'Aubernoun, Stoke D'Abernon in Surrey, of the year 1277.

These brasses were of *two* distinct kinds. First, the *Flemish* brass, as it is called, and secondly, the *ordinary English* type, such as you see on the board.

To take the Flemish, or foreign style, first. It is not difficult to recognize as a general rule the specimens in England which still remain of these Flemish brasses from the genuine productions of the native English artist's hand. The whole style of art on the continent, whether we consider its architecture, painting, or decorative work, was of a far more elaborate and intricate a design than anything the English workman ever did or was ever likely to produce. I do not think this can be better evidenced than by a glance at the English and Foreign cathedrals. The stern severe massiveness of the one, and the intricate, richly adorned, elaborate design of the other, affords a most striking and instructive difference. I will pass you round a very beautiful photograph of Milan Cathedral, which will, I think, excellently show what I mean; we have nothing of this sort to be seen in England that I know of.

When we come to the monumental brass we still find this characteristic equally visible and distinct. Let me just point out a few of the more striking peculiarities that will easily enable us to distinguish at first sight the work of the Flemish and genuine English studio. I shall say first of all that these foreign specimens are called *Flemish*, since it is probable that many of the brasses on the continent, as well as those non-English ones in our own country, are the work of Flemish artists, who were early distinguished for their skill in this branch. The main characteristics are as follows. First, these brasses are composed of *one single large sheet of metal*, itself made up of neatly joined smaller pieces, and containing the entire design, that is to say, the figure, canopy, border, and other ornamentation, without any introduc-

tion of stone work between the various parts of the pattern. The design itself is intensely elaborate; the figures—for besides the one figure of the person deceased, there are introduced other smaller representations of angels, saints, and so on, round about the principal effigy—appear somewhat of a less stiff and conventional attitude than the purely English type. The ground work behind these figures being (and in this it is unlike the English School, which introduces stone) formed of metal, allows of very exquisite diaper patterns being engraved, and I believe in many instances, though now worn away, let in with enamel. The most remarkable feature however of the whole brass in these Flemish specimens is the Canopy. We often indeed find very beautiful and exquisitely worked canopies in our purely English designs. They are however, at any rate in elaborateness, far inferior to their foreign brethren. I have drawn out roughly on the board a fine specimen of the two Schools; and I think the characteristics are definitely enough marked there to want little or no more comment. You will see the introduction of the smaller figures in the canopy, and up the side of the brass, though not altogether unknown in English specimens—I may mention the brass of the last Prior of Lewes, now in Cowfold Church, Sussex, where there are three figures, the Blessed Virgin and Infant Christ, S. Pancratius, and S. Thomas of Canterbury—although I say these figures are not unknown, they are still exceedingly rare in English brasses, exceedingly common in foreign.

Before leaving this first division of the brass monumental effigies, let me mention one or two principal places in England where they are still to be seen. The earliest mentioned specimen is at Lynn, in Norfolk, 1349; another at Newcastle-on-Tyne, and one at S. Mary Quay, Ipswich, of the date 1525. One of the most beautiful I have ever seen of this style was a rubbing from the brass of Thomas de la Mere, at S. Alban's, somewhere about 1390. This brass was engraved by order of Thomas himself during his life-time, and had spaces left all round the border to be filled up after his death with an account of his worth and virtues. Either he failed in the latter, or was unfortunate enough to have no friend to fulfil his wishes; at any rate there is at present no trace of these blanks having ever been filled up with the desired record of the deceased abbot's good qualities.

Passing from the Flemish style we come to the genuine English school, of which there are so many excellent examples in nearly all the old Parish Churches in this country, more especially in the southern and midland counties. The point in which they are most strikingly different from the last-mentioned class is, that instead of having the design wholly contained in one sheet of metal, the various portions of it, such as the figure, canopy, and legend are let into a flat slab of stone, raised or not as the case may be, and thus setting off the pattern on a background of plain stone work. This naturally led to the second great difference, namely that you have little

or no diaper work, less elaborate canopies, less intricate side borders; of course where there was no more metal used than was absolutely necessary, there could not be the same highly-finished, delicate engraving. True towards the end of the 16th and 17th centuries you do find specimens of English work on single plates; but the coarseness of the workmanship, the want of elaboration, and the *tout ensemble* of the whole design, render it absolutely impossible to confuse these debased specimens with the earlier and beautiful foreign instances of the 13th and 14th centuries.

I have spoken of and described the foreign Flemish brasses first, for although the earliest extant English specimen, which I have already mentioned of Sir John D'Aubernoun, is of the date 1277, some hundred years or so before the earliest Flemish brass I know of at Mawgan, in Cornwall, it is quite certain that the manufacture of these monuments was commenced and carried to a great perfection abroad long before they were definitely established in England as a branch of English art; although therefore they accidentally, so to speak, in England, come second, they ought intrinsically to demand our first attention.

Leaving, however, this rough comparison between the schools to fix our attention more exclusively on the latter, that is the purely English style, let me endeavour to point out a few of the leading characteristics of this branch and one or two of the more interesting details connected with it.

To take first what are called *Palimpsest* brasses; that is to say, a brass carved and intended at one date for some particular individual, and then afterwards employed as an effigy later on to commemorate somebody else. These *Palimpsests* are by no means uncommon, and I doubt not if many of the brasses in our churches were removed they would be found to belong to this class. There were three distinctly different modes of thus transferring the monument from the memory of one person to that of another. First, the original brass was taken up, and on the opposite side was carved afresh a figure and its accompaniments to suit the new owner. Thus, in a brass at Cobham, Surrey, we have on the one side the figure of a Priest in full Eucharistic Vestments, holding a chalice, of the date 1510 or thereabouts, and on the other that of a man in armour, evidently some 50 or 60 years later. To discover on the one side foreign workmanship, and on the other English is by no means of rare occurrence, as will seem natural if we remember that the actual brass plate was not manufactured in England till many years after the art of engraving the effigies even in our own country had attained to the highest perfection; indeed not till Elizabeth's reign, when the art was considerably on the decline.

The second class of these *Palimpsest* brasses are those in which the figure has been altered in parts to suit the style and costume of the individual now desired to be represented. Thus at Waterpery, Oxfordshire, we find the

figures of a knight and lady, which had been altered from the style of the middle of the 15th century, to suit that of the middle of the 16th.

The third and last class is little other than a modification of No. 2, in which, though the figure remains untouched, the inscriptions and date have been changed to suit their new purpose. I think these last two classes teach pretty evidently how little attention was paid to giving any actual representation of the features and general aspect of the deceased, provided the date, inscription, and in some degree costume of the individual was accurately given; a fact which is also evidenced by the remarkable sameness visible in all the expressions, varying more than anything else according to periods, in the brasses alike of Ecclesiastics, knights, and civilians. I should mention here that in some cases duplicate brasses have been discovered in which the same person has been commemorated twice or more over, sometimes in different churches, I suppose parishes with which the deceased had been connected; sometimes in the same building; thus we find the effigy of a woman at Childsey, Berks, first in the garb of a civilian's wife, afterwards at Shalston, in that of a nun, thus pourtraying her during the two periods of her life. Again, Ralph Hamsterley, master of University College, Oxford, had three different brasses erected to him in different colleges in that city.

Leaving the *Palimpsest* and duplicate brasses, let us examine for a few moments the actual effigies, or figures themselves, the representations of the persons, whose memory was wished to be handed down to posterity. All brasses fall under three heads: those erected to ecclesiastics, those to military personages, and those to civilians. Let us take them in this order.

First the brasses of ecclesiastics.

All ecclesiastics were interred in full vestments; the effigies therefore which we have remaining are faithful and exact representations of the body, at any rate in costume, over which they were laid, or in commemoration of which they were erected. Priests are the most frequently depicted; rarer, bishops and abbots; still more rare, deacons: an instance of the latter may be seen at Harrow, bearing the date 1468. One of the finest bishop's brasses I know is at New College, Oxford, to Thomas Cranley, Archbishop of Dublin, 1417. It is however with the priests that we need chiefly to deal this evening. These were represented in three distinct classes of vestments.

1. *Eucharistic.* 2. *Processional.* 3. *Academic.* I do not care at present to go into a careful description of the different vestments worn by the priesthood, and depicted on the brasses; the chief and easily recognizable difference however between the first and second classes being that in the first, the priest wears the *chasuble* or large oval shaped vestment, such as you see drawn on the board, in the second, the *cope*, or large sort of cape open in front, and often elaborately embroidered: this latter was worn in processions, during the Magnificat, at the Communion or rather ante-communion office, and on

other solemn occasions such as coronations etc., the chasuble being reserved exclusively for the celebration of the Holy Eucharist. The academical habits are not common, but when found are very easy to recognize without more description. You will see I have drawn roughly some specimens on the board. The brasses of monks and abbesses are very rare: perhaps of the latter there are only two instances, at any rate extent; one at Elstow, Bedfordshire, the other at Denham, Buckinghamshire, both about 1540. Doubtless, this was in great measure owing to the religious orders being bound by such strict rules of poverty, as to prevent their going to the expense of a brass memorial. Sometimes ecclesiastics were commemorated simply by the erection of a brass cross, with or without a lead in the centre, or again by a simple chalice, or other emblem of their profession. These are however rarer, and it is difficult at the present day to know whether there was any real difference between such emblematical representations, and the actual figures of the deceased under a canopy.

Passing from the ecclesiastics we come to the military brasses. These are particularly interesting as showing more variation than the former class in the different stages under which the defensive body-armour of the middle ages on till the end of the 17th century passed in its progressive developements. To point out roughly a few of the more remarkable of these. The earliest military brasses we find represent the figures as clothed in the mail armour so common during the 13th and early 14th centuries throughout Europe; and one distinguishing mark of the effigies of this period is that in nearly all cases the legs are represented as *crossed*. You will see a figure on the board. I think very probably this attitude was given in order, in some degree, to form the sign of the cross. The next style we find, but of which examples are very rare in brasses, shows a slight mixture of the plate armour on the shoulders, legs, and knees, with the older mail. Of all, perhaps, this was the most beautiful kind, if we may judge from the monumental remains. From the middle of the 14th century and downwards we find the introduction of the common plate-armour, which, though it underwent various modifications and changes, never lost its leading characteristics, till the cessation more or less of any such defensive armour at all in the 17th century. With the figures of the knights and other military personages there were also in the generality of cases given those of their wives, sometimes, if they had been married more than once, of their different wives; I have at home a late brass which represents a knight kneeling with his hands clasped in the attitude of prayer and extended to a figure of our Lord rising out of the tomb, while behind him kneel his three wives, the last one having evidently died after her husband, as the inscription in her case is in Latin, of the other two and the man, in English. I may here remark that this attitude of *kneeling* is almost always a sure sign of late brasses, you will scarcely ever find an instance in any specimen of the golden period of the art with the figures

in this position; it was I suppose an attempt to give a more free and natural appearance to the figure, but the effect is thoroughly bad and coarse when compared with the solemnity and stateliness of the earlier ages. The man was ordinarily represented as standing on a lion or griffin, as an emblem of his high courage and resolution; beside the *woman* we frequently see the figure of a dog, the type of fidelity and honesty. There is nothing in the art of the Middle Ages more striking than the beauty and appropriateness of their emblematical devices.

I must hurry on just to take a glance at the third order of brasses, viz., those of civilians, perhaps the most generally interesting of all the three, inasmuch as there is more variety visible in costume and idea than in the military effigies, and infinitely more than in those of the ecclesiastics. The brasses of ladies are peculiarly worthy of attention, manifesting the most extraordinary styles of head-gear imaginable. I have drawn one or two just to show what I mean; the vanity of dress was certainly not altogether unknown in those times, and I am afraid we have not much improved on them, at least in that respect. The brasses of children *alone* are not common, indeed I think almost unknown till late in the 16th century. Earlier however we find small *groups* of children, as in the Preshute brass on the board, in which the boys are placed under the father, the girls under the mother.

I have not been able to do more to-night than just point out one or two of the most noticeable facts connected with the study of monumental brasses generally, a study which is so wide, contains so much of detail, and is so difficult to sketch in mere outline, that I feel I have been able to do but scant justice to my subject which, however, I would recommend to the consideration and attention of every member of this Society, more especially to those of the Archæological Section. If I had had more time I should have liked to shew with greater accuracy and clearness the various stages and developments of this branch of art from its rise in the 13th, through its glory in the 14th, and early 15th centuries, till its decay and utter disappearance in the 18th; a disappearance which I hope we shall within a short time be able to say no longer reflects on our good taste and love of artistic beauty; for with the revival generally of æsthetic cultivation we may hail the improvements visible in our sepulchral memorials, and in the attempt, let us trust a successful one, to introduce once again into our churches the long disused brass, if not as yet in all its former splendour of workmanship yet still in a manner not absolutely unworthy of it. But I most not go further at present. Now the subject has been once fairly introduced, and set I hope on some permanent footing in this society, it remains open to anyone to take a portion of its considerable extent, and read you other papers on different divisions of the study—I might suggest on the brasses of this or that county, this or that century, or to take the divisions I made before of ecclesiastical,

military, and civilian, and so on. Time so spent I am sure will never be repented, if only we go to work in the true and proper spirit. Every branch of Archæology can teach us much; few branches more than the investigation of the sepulchral remains of a people, who so loved and so honoured their departed friends.

There were 72 persons present—3 Honorary Members, 23 Members, and 46 Visitors.

MEETING HELD OCTOBER 16TH, 1868.

THE following donations were announced, and thanks ordered to be given to the Donors:—

A Quail *(Coturnix vulgaris)*, by G. H. Dawson, Esq.

An egg of the Kentish Plover *(Charadrius Cantianus)*, by A. C. Preston.

Skins of Golden, and White-tailed, Eagles, by the President.

A variety of the Common Linnet called by old Authors the Red-Pole Finch *(F. Cannabina)*, by S. A. Rogers.

Three specimens of the Large Blue (*P. Arion*), by Mr. Nicholls.

A specimen of Dog-tooth Spar, and dorsal vertebræ of a species of Ptychodus, by F. Giles.

A collection of Ferns, by J. B. Oakeley.

A specimen of Queen-shell (*Cytharea Chione*), covered with Serpulæ, by Mr. Chate.

Figuier's 'Insect World,' by the Rev. G. W. De. Lisle.

EXHIBITIONS.

A Spanish Hoopoe, by E. S. Preston.

A fasciculated branch of a Vegetable Marrow, and a large series of Potato products, by the President.

Some Chinese paintings on Talc, by C. J. Irwin.

G. E. Manisty was elected Secretary, and F. Giles a Member of the Committee, in place of S. Image, who left.

A. C. Blaker was elected an ordinary Member, and G. H. Dawson Esq., and S. Image, Esq., Honorary Members.

E. im Thurn read a paper on the 'Classification of Birds.'

There were 66 persons present: 2 Honorary Members, 24 Members, and 40 Visitors.

MEETING HELD OCTOBER 30TH, 1868.

THE following donations were announced, and thanks ordered to be given to the Donors:—

A skull of a child, showing very clearly the first and second dentition, by J. Walker, Esq., M.D.

A specimen of cement from Stonehenge, by Mr. Baverstock.

EXHIBITIONS.

A specimen of Queen Termite, by E. C. Sewell.

A specimen of petrified wood, also by E. C. Sewell.

A series of Teas, and Tea substitutes, by the President.

E. im Thurn read an interesting paper on his tour in the Engadine.

J. F. Cornish was elected a member of the Society.

There were 38 persons present: 2 Honorary Members, 13 Members, and 23 Visitors.

MEETING HELD NOVEMBER 13TH, 1868.

Some English Coins were presented by Mr. Chivers.

EXHIBITIONS.

H. M. Hilton exhibited some Moths, illustrating brilliancy of colour.

The President exhibited a Stem of Cycas, and an *Ornithorhyncus Paradoxus*; a Cuttle-fish, and a Dog-fish.

E. M. Hall exhibited a Turkish Purse, a Chain made of Grass, and a Seed Pod of *Trapa bicornis*.

H. M. Hilton also exhibited a collection of Shells.

E. Almack exhibited a peculiar Flint from Bucks.

E. C. Sewell then read the following paper, illustrated by diagrams, on

THE ROMAN VILLA OF CHEDWORTH.

THE subject on which I am going to speak to-night may seem rather a singular one to some of my hearers; but living as I do at Cirencester (the ancient Corinium), which is surrounded by Roman Remains, I think it only right to try and give you some idea of the houses in which the Romans, colonized in England, lived.

Before entering into particulars, I must tell you that a great portion of this paper is taken from a report read by a Mr. Scarth on the Villa. The discovery of this Villa was made, singularly enough, by an under game-keeper

who was engaged in ferreting for rabbits and came upon some pavement while digging one out. It is situated on a declivity of the Cotteswold Hills, on the estate of the Earl of Eldon, through which runs the river Coln. It is distant from Gloucester 16 miles and 9 from Cirencester. On hearing of the discovery of such a prize on his estate, Lord Eldon gave orders that excavations should be made entirely at his expense, and he not only had careful plans made of the uncovered portions, but he has also had sheds erected over the pavements and a museum built on the spot, to contain the interesting relics which have been brought to light. The walls of the Villa, too, which, owing to the peculiarity of the situation on the slope of a hill, remain to a greater height than usual, have been protected by having copings placed over them formed of the roofing tiles which formerly covered in the Villa. Stoves and the needful apparatus for preserving the floors from frosts, have been placed within the sheds, and every care has been taken to preserve this very interesting monument of the household arrangements of the Roman times from injury by weather or other mischance. Although much has already been brought to light, yet the entire extent of the buildings has not been ascertained, as fresh traces of walls are continually occurring.

The Building seems to have formed three sides of a square, one being much longer than the other two. The portions laid open appear to have been (1) *The Villa Urbana*, which contained the apartments of the proprietor: (2) *The Rustica*, for the farm labourers: and (3) *The Fructuaria*, or store houses, which probably remain to be uncovered. The form of this Villa from its perfect preservation will be found to be very instructive when compared with others. More of it remains than is usually found in Roman sites, and it has been less destroyed, being situated on the declivity of a hill. It will bear comparison with the Villa at Lydney, or the other Roman Villas which have been found in Gloucestershire, as at Stancomb Park, Woodchester, Whitcomb and Withington: and the pavements are in very good preservation and show a high state of art, while one of the subjects is of unusual interest, of which I will speak further on. The finding of at least 257 coins, most of them of the late Roman period, enables us to fix pretty accurately the date of its destruction, and the period during which it was inhabited: while the finding of the *Christian Symbol* Chi and Rho, the first two letters of Christ, cut upon the stones of the building, enables us to fix the building, or repair, or enlargement of the villa at a period subsequent to that of Constantine the Great.

One of these monograms was found under the steps leading from the long corridor into the Villa Urbana and on this account the building is considered by some to have been Christian. A third monogram also has been found on a *metal* stamp. Finding the Christian monogram under the lowest step is certainly a singular fact, but there is no Roman example of the Christian monogram before A.D. 307, (unless the statement of Dr. Rossi be correct, that

he found one of an epitaph of A.D. 298). It is to be regretted that only one inscribed stone has yet been found. This bears the letters PRASIATA, which only lead us to regret the loss of the remainder, while it leaves it open to conjecture, whether this building had in any way been connected with the descendant of Prasatagus, the husband of Boadicea. Most probably the name still survived among the Romanised Britons after the time of Constantine the Great. The tesselated pavements are of a flourishing period, and certainly not in the decline of the Roman Power. They bear a close connection with those discovered at Cirencester, and the same artists may have designed and executed the tesselated floors at both places. Cirencester has proved rich in Mosaics, which are well preserved. These pavements are of a very high order of art. Since their discovery, a pavement, treated in a similar manner, has been found on the site of Carthage, and probably belongs to Roman times, when the City was rebuilt and colonised by that people.

Corinium, like Aquæ Solis, seems to have been the centre from which the arts and elegancies of a refined state of society penetrated into the surrounding country. Twenty Roman Villas have been laid open within the radius of a few miles of Bath, and around Cirencester they seem to have been almost as numerous, and similarly round Gloucester. When these cities fell into the hands of the Saxons, the neighbouring villas most probably suffered pillage and destruction. The coins found at Chedworth in the Roman villa correspond in date to those found in the villas excavated round Bath.

Before, however, attempting to unravel the history of this villa, something ought to be said about its plan, as far as it is yet ascertained. In the portion which is regarded as the Villa Urbana, in which are contained the tesselated floors and the bath, there are sixteen chambers and two long corridors. These chambers form two sides of the square, and it seems probable that the buildings have extended yet further East or South East. The principal apartments have faced the east looking up the pretty valley of the Coln. The long corridor and the rooms behind it, in which are the elegant pavements, caught the beams of the rising sun, and must in summer time have been gratefully cool in the evening. In this portion, at the northern end, are the baths, with a flight of steps leading into them out of the corridor. Under these was found the Christian Monogram. The suite consists of three apartments, and the passage with the bath, which together occupy half the space. They do not appear to have communicated with the chambers at the south end of this portion of the villa, which were entered by another flight of steps. The *tesselated floor* at the south end interested me most, on account of its elegant pattern and execution. It seems to contain the figures of a dance eight in number, in which the partners gradually approach and move round each other, till in the last figure

the gentleman places a chaplet on the head of the lady. This may be seen in his hand in the first figure.

Unfortunately several of the compartments have been broken up by the burrowing of rabbits. The length of the larger compartment (number 1 in the plan) is 28 ft. 9 in. by 18 ft. 6 in., No. 2, is 13 ft. square, and No. 3 is 14 ft. 6 in. by 18 ft. 6 in. These, no doubt, were the principal living rooms. The sleeping rooms and slaves' apartments seem to have been at right angles to these. The complete Roman Villa seems more to have realised the character of one village, for all the slaves and retainers of the Roman master seem to have their allotted place within his residence, whereas with us each labourer or artizan has his own cottage, and lives apart from his neighbours. In continuation of this line of buildings, facing the east, is that very interesting portion which contains an octagonal basin of pure water, fed from a spring near at hand. The water from the reservoir is conducted into it by a drain. This portion occupies the northern corner of the villa, as far as yet explored, and terminates in a circular apse. It is difficult to say what was the purpose of this chamber. At one end of this, to the left as you enter, was found a stone altar, without any inscription on it, of the usual form, and there are also three small recesses in the wall. Was this altar placed in honour of the deity presiding over the spring? and did the ancient altar remain after the tenant of the villa had become a Christian? The same cool waters which refreshed the Roman and his retainers, now minister to the comfort of the villager or country visitor. Just below this octagonal reservoir, and at right angles to the corridor, which fronts the chambers with tesselated pavement and the bath just described, is a second long corridor which has also been paved with tesseræ, the upper portion of which seems to have been supported on pillars, two of them, about 12 ft. apart, still remaining *in situ*.

At the back of this long corridor is a range of buildings which I have supposed to be the Villa Rustica, or that allotted to the labourers on the farm. This is only a conjecture, because much remains here to be uncovered, and traces of floors and pilæ, as well as baths, appear to be under the surface. These baths, like the others, were approached by steps out of the corridor. To the east of these and behind the corridor, there appears to have been a recess 11 ft. deep and extending about 50 feet. The corridor is paved throughout its whole length, but the pavement is much destroyed. Behind this seem to have stood the baths and washhouses, the mill for grinding, and the floor for drying the corn; and probably also the anvil and the forge, and whatever was needed for the use of a country gentleman's or nobleman's residence. The *Pars Rustica* consisted, first, of a kitchen, which being the general resort of the slaves, must be spacious, and likewise, as a security against fire, should be lofty, and secondly of the slaves' apartments. The slaves who were at liberty, were to have their respective cells looking towards the South, those

who were kept chained ought to be provided, for their prison, with a room as healthy as possible, underground, and with numerous but narrow windows, so high above the floor as to be out of reach, at least so says Mr. Daubeney. In Listercomb bottom, in the same parish of Chedworth, were found the remains of the bath or Hypocaust, and the pillars which supported the floor, and the bricks are said to have borne the stamp *Arviri*, in Roman capitals about 3 in. long. There was a spring of water and a cistern to receive the water, and several things are said to have been found and destroyed at the time. One of the bricks was preserved, and this was the only record that remained of what probably was another interesting villa which bordered the banks of the river Coln. When I visited the site of this discovery last year, traces of Roman bricks were still to be seen in the course of the small stream that trickled down the side of the hill. Mr. Lysons says, "It would be worth while to investigate this locality still further. The finding of these bricks with the stamp of "Arvirius" upon them is very interesting, because the name at once reminds us of the British King "Arviragus," as the finding of the name "Prasiata" or "Prasuiti," reminds us of another "Prasutagus," both mentioned by Roman writers."

A pair of small manacles has been found in the Villa of Chedworth, which seem more suited for the hands of a young person than of one grown up. There was also a dwelling near the gate for the Villicus or Bailiff, whose duty it was to look after the slaves. A Roman Villa in Britain was probably not fully and completely provided with all the requisites of Roman hospitality; but as we find the tesselated floors of the living rooms and the baths and corridors, so I have no doubt but that further excavations will reveal the portion denominated "Fructuaria," which received the farm produce. Here was the Granary, the wine press, and wine cellar, but in this villa these may have been united with the villa Rustica, and there appear indications that it was so, but the whole extent of the building towards the east is not yet uncovered.

I think that I have mentioned the word *Hypocaust* more than once in this Paper, and I will now explain it for the benefit of my hearers. A Hypocaust is a place in which heat was generated for conveyance to adjoining rooms. It was not the practise among the Romans to use open Fire Places, as their rooms were floored with tiles, laid on concrete and supported on props. The hot air from the hypocaust was caused to pass between the props beneath the floor. In this way the floor was heated and the room warmed. It had often been a puzzle to know what they did with their smoke. Pliny, however, stated that the smoke, after leaving the chambers under the floor, was carried on into the wood-house and there expended its heat in drying the faggots. The small arched chamber in which the faggots were burned is called the Præfurnium. The method of flues, by which the apartments of this villa

were warmed, remains in a very perfect state. We find not only the remains of stoves, but the flues in the wall are perfect to a certain height.

In few Villas can the arrangements of the baths be studied to more advantage, and, as the excavations proceed, we may hope to arrive at a perfect knowledge of the arrangements of a Roman country Villa. Leaden pipes have been found, one of which carried the water from the octagonal reservoir into a small trough 15½ inches long by 13 in. wide, and 9½ in. deep. Ten of the 23 rooms or spaces which have been uncovered are 24 ft. 6 in. long and vary in width from 9 ft. to 24 ft.; one is of a pentagonal shape and underneath it are stone drains large enough to admit a boy. In one room a mass of molten lead was found, weighing 67 lbs. It had evidently poured off the roof of the building into a hollow place, and we thus have a very clear proof that the villa was destroyed by fire. A Lime Kiln also, 9 ft. deep and 10 ft. wide, was found in the wood behind this second portion of the villa, being, as I believe, the only instance which has ever occurred. Just below the reservoir, a forge is supposed to have stood, as three large and very curious pigs of iron were found, of which Professor Buckman has been kind enough to give me the dimensions and weight.

	Length.	*Circumf.*	*Weight.*
No. 1 ...	38 in. ...	26 in. ...	356 lbs.
„ 2 ...	64 in. ...	26 in. ...	484 lbs.
„ 3 ...	39 in. ...	25 in. ...	256 lbs.

Iron implements were very abundant and curious at Chedworth; amongst them were an oyster knife, portions of locks, shears, a pair of lady's curling tongs, and horse-shoes. It is interesting to observe that the horse-shoes were made without the heel flange, which is adopted in the modern horse-shoe, and which veterinary surgeons have pronounced unnecessary. A very beautiful pair of compasses or dividers was also found, so like those that we use in the present day that one can hardly believe that they are nearly 1500 years old. A steelyard with a leaden weight attached to it was also discovered in very good preservation, the nicks on the bar being perfectly clear.

In conclusion, I cannot do better than tell you what the pavement of the Romans is composed of. The green material, of which I have no specimen, and some of that of a lighter colour, was produced from the Lias Limestone. In all probability, the nearest point from which that could be obtained was Fenton in Warwickshire. *The White stone* seemed to be a portion of the great Oolite at Cirencester, which was very compact indeed, and crystalline in its structure. *The yellow stones* were doubtless from some of the more compact beds in the interior of the Oolite district. *The Grey tinted* stones were probably of the same material as the white Oolite, which was found to take a grey tint on being heated. Some of the *black Tesseræ* were undoubtedly pottery.

No glass has been found in the pavements of this Villa, but in one at Cirencester there was some discovered.

To conclude, it is true that the Roman remains found in this country may not be equal to those found on the Continent of Europe, or in Asia, or in Northern Africa, yet the works of Roman Art, and the remains of Roman buildings found in Great Britain, have a particular value to the modern inhabitants of that country: they are a speaking evidence of its past historical importance: they confirm and illustrate its past history; and they form a correct standard by which we can estimate our progress in the arts, or our decline in them, the changes which the lapse of ages has wrought, and the different tastes which at different times have animated the inhabitants of the same island.

There were 47 persons present:—1 hon. member, 20 members, and 26 visitors.

MEETING HELD NOVEMBER 20TH, 1868.

EXHIBITIONS.

Marlborough farthing, Seaman's medal for the capture of Portobello, Crown of Charles II., Half-crown of William and Mary, and other coins, by Rev. J. Sowerby.

A lion's skull, presented by J. Walker, Esq., M.D.

A money bag and cloth made from the palm, and flower of *Bougainville Speciosa*, by the President.

W. Fergus, Esq., M.D., then read a paper, illustrated by numerous diagrams, on "The Tongue."

There were 82 persons present:—3 honorary members, 21 members, and 58 visitors.

MEETING HELD DECEMBER 4TH, 1868.

A collection of Beetles and other insects from Ceylon and Australia; and specimens of Pipe-fish, Hippocampus, etc., were presented by C. W. Elwes, Esq.

EXHIBITIONS.

Two forms of crystals of Carbonate of Lime, by W. G. de Jersey.

Specimens of Echini and Sponges from the Forest Hill, by F. Dobree.

Box of Moths, by H. M. Hilton.

Chameleon, fruit of prickly pear, and gulf-weed *(Sargassum)*, by the President.

W. D. Fenning then read the following paper, on

ENGLISH COINS.

A collection of coins is interesting for several reasons. They show by their execution the amount of care paid to such matters by those who coined them; they also frequently act as a check upon history, rectifying mistakes in dates, and enabling us to determine the geographical position, the political condition, and the nationality of towns of which they are the only remaining traces. By them we are enabled to identify busts and pictures, the heads on them being frequently accurate portraits. As works of art, too, they are valuable, often being very beautiful.

To attempt to give you any account of the origin of coinage and its early history would take more time than we have, and would be far beyond my power. I shall, therefore, restrict myself to the English series, illustrating what I have to say by such of the coins themselves as I am able to obtain either from the Society's collection or other sources. The English series is the most perfect, if not the most artistically or historically interesting of any modern series. It begins before the Saxon Heptarchy and reaches almost without interruption to the present time. We are thus enabled to trace the changes of language during this period, as shown by the legends, while the changes in the titles of the successive kings form an interesting commentary on history, showing the amount of power which the coiners imagined themselves to have.

I shall attempt to give you an account of such coins as from their history or their rarity or other reasons seem most worthy of notice, and then make a few remarks upon the process of coinage and matters connected with it.

Of all coins the one first in use of the existing series is the silver penny, which, with its halves and quarters, was for a long time the only British coin struck. The word itself is derived from the Latin *pendo*, or according to others from *pecunia*, or again from the Gallic *pen*, a head. The earliest known specimen is one struck by Ethelbert, King of Kent, though mention is made of examples of an earlier date. Pennies of most of the kings of the Saxon Heptarchy are found, and from Edgar, who united the greater part of Britain under his control, till the present reign, Edmund Ironsides, Richard I, and John, are the only kings of whom no pennies are found, the series thereby lasting more than a thousand years. There were originally 240 pennies to a pound, giving 24 grains each, but this weight was gradually decreased. Their standard purity seems to have been 10 oz. 2 dwts. fine to 11 dwts. alloy. I can show you no specimens of Saxon coins, and shall therefore say nothing about them. The Normans, otherwise so energetic, made no changes in the actual coins, and for a long time the penny was the only coin in existence here. The

obverse has the king's head, generally full face, and differs a little in each reign, especially in the developement of the crown. They are very rudely struck, though other arts, especially that of the goldsmith, seem to have been decidedly flourishing at this period. In the reign of Edward I the head of the king and the general design of the coin first assumed that style which continued without change till the reign of Henry VII. No difference was made to suit the individual likenesses of the respective kings. There was in fact merely a conventional king's head, a full-faced bust, crowned, the crown consisting of the three fleurs-de-lys and two lozenges or balls: with the hair abundant and curled. The whole is enclosed by a circle, surrounded by the king's titles. The obverse bears a plain cross, with three pellets in each angle, and bears the name of the town where it was struck. After Edward III's reign the penny is no longer the only coin. In the 18th year of Henry VII's reign a great reform was effected in the whole coinage, and from his reign onwards the penny changes under almost every monarch. James I's penny, for instance, bears a rose on one side and a thistle on the other. The last penny I have is one of Victoria, but they are too small for use and, I should hardly think, would be used again. The pennies were frequently halved and quartered to act as half-pennies and farthings.

The next coin is the groat, of the value of 4d. It was first struck in the reign of Edward III and is of much the same pattern as the penny. The legend round the outer edge of the obverse is "Posui Deum adjutorem meum." There were also half groats coined, of the same pattern (only smaller) as the groat. The groat is still perpetuated in the 4d. piece; but the half-groat has now been supplanted by the threepenny piece.

The shilling was first coined by Henry VII., in 1503. The term had been used as a "money of account" long before, William I. making the Saxon shilling equal to fourpence, and the Norman one equal to twelve pence, a somewhat curious and one-sided arrangement. It was originally called a testoon from the French tête, a head, from the king's head on it, and the word tester is still used in some parts of the country. It was the first English silver coin which bore the royal arms. I can show you one of Edward VI. In his reign sixpenny and threepenny pieces were first coined of the same pattern. Here is a sixpence of Elizabeth, considerably larger you see than our present sixpence.

The crowns and half-crowns were first coined under Edward VI., in 1551. The series of crowns is, perhaps the most beautiful, and I am sorry I have no more to show you, though I daresay you have all seen some of those last issued, and all have seen half-crowns. The florin, the only other silver coin now used, was not issued of its present value till the present reign, and being one-tenth of a pound may be considered as a step towards the decimal coinage about which there has lately been so

much talk. Of silver coins that have been issued and not continued, I can show you a piece of three-halfpence and a piece of three-farthings, both issued by Elizabeth and not before, in spite of Shakspeare, who makes the bastard Faulconbridge in King John, while taunting his legitimate brother (whom he had just before called "a half-face groat," in reference to groats which had just been issued and had the Queen's head in profile) say, after enumerating the other personal defects of his brother—

"My face so thin
That in mine ear I durst not stick a rose
Lest men should say, look where three farthings goes."

alluding to the rose it bore. These small coins, however, were soon withdrawn, though here, you see, is a three half-penny piece issued in the present reign. Edward VI also issued double crowns in silver, but they did not last long. A twenty shilling and a ten shilling piece of silver were coined at Oxford by Charles I during the civil war.

We next come to the gold coins, of which I have not so many specimens to show you. There were only a very few coined by the Saxons. Henry III issued a few gold pieces, worth 1s. 8d., which were called pennies from the resemblance they bore to the silver penny. Edward III was the first to issue a gold coinage of any extent and his may be considered the first real gold coinage.

The first were florins, half-florins, and quarter-florins, the florin being 6s. Its name is derived from a Florentine coin, which, however, it resembled in no way whatever. The florin bore two leopards, the half-florin a mantle bearing the arms of England and France, the quarter-florin a helmet. These were soon re-called and Nobles were issued instead. They gained their name either from their purity and execution or from the nobility, as it were, of the metal. The obverse bears a ship with the King standing in it. It is probably a symbol of the state, and not as Selden, a poet of Henry VI's time, says—

"But King Edward made a siege royall,
And wonne the town and in speciall
The sea was kept, and thereof he was lord;
Thus made he nobles coins of record."

As the King is considerably larger than the ship it is rather hard to imagine how he could have got in. The reverse bears a rich cross, with lions or rather leopards to fill up the vacancies, and has the legend "Jesus autem transiens per medium illorum ibat," said to be the best charm against thieves. The quarter noble, you see, bears the arms of England and France quartered on the obverse, while the reverse is the same as that of the noble, which passed for 6s. 8d. This series in execution and design is extremely beautiful. Edward IV first made the nobles pass for 8s. 4d., and then for 10s., calling them rials, a French corruption of royal. They all bore the sun in the centre of the

cross. He also issued angels and half angels, giving them that name from their device, which is the archangel Michael piercing the dragon. On the reverse was a ship, with a cross for a mast, and a shield leaning against it, bearing the royal arms. Henry VII issued double rials, which bore the king in full robes, and were hence called sovereigns. On the reverse is a full blown rose with a heraldic shield in the middle. The spur rials gained their name from the sun in the middle, the rays resembling spurs. Henry VIII issued a George noble which bore St. George and the dragon on the obverse. He also issued crowns and half crowns of gold. In James I's reign the gold coinage was reformed, and the following coins were authorised. First, a 30s. piece, with the king in parliamentary robes; secondly a 15s. piece, with a lion, crowned, holding the sceptre and the shield; and lastly the 10s. piece, the angel, with the old device of Michael, &c. Charles II coined £5 and £2 pieces. In his reign the term guinea was first used, the sovereign being made of gold from Guinea. They fluctuated a good deal in value. The spade guineas of which I have a specimen, were first issued in 1787, and the half-guineas about the same time. You see the shield on the reverse is quite simple and is in the shape of a pointed spade. The seven-shilling pieces, which bear a crown only on the reverse, were issued at the same period. George IV coined double sovereigns. It bears the George and the dragon, which had appeared on the silver crowns of George III, and is most beautifully executed. Here too is a £5 piece of the same reign, lent to me by Mr. Lucy. This too is very nicely executed. He had a short time ago, he tells me, a five-guinea piece of much the same pattern, only a little larger.

We now come to the copper coinage. As copper had been the chief metal for the Roman coins, it is curious that the kingdoms formed after the dissolution of that gigantic empire should have so entirely abandoned the use of that metal for their coins. At first the black or base money of the continent was circulated in England as small change. During the reigns of the Tudors private individuals coined copper tokens, but the monarchs for a long time had a prejudice against a copper coinage, and it was not till Charles II's reign that there was a royal issue. He first issued a few farthings, but this was not enough, and the number of the tokens at length, in 1665, compelled him to issue some half-pence. On the obverse they bear a King's head with the legend "Carolus a Carolo;" and on the reverse Britannia, with the motto "Quatuor maria vindico." The figure of Britannia is said to have been a portrait of the beautiful Frances Stuart, and is very graceful. The farthing bears the legend "Nummorum famulus." Tin coins, or tin with a copper plug in the middle, were issued about the same time. I have here some half-pennies of William III. George I. issued £40,000 worth of copper coins, of which I have a half-penny and a farthing. In spite of this there was a great lack of them in George III's reign, and tokens were again employed

till in 1797 Mr. Boulton of Soho, Birmingham, entered into a contract for coining 500 tons of copper. These are the cart-wheel coins, so called from the raised rim round the edge, intended to prevent rubbing. You see I have a two-penny piece and a half-penny; they are well executed. The pennies weighed exactly one ounce, so that if you thought a dealer was using false weights, you could use your own penny instead, but they must have been very awkward for carrying. However, as those who used copper for other purposes preferred melting down these coins to buying new copper, they were soon withdrawn, and the series then issued has lasted with but few alterations till a very few years ago. You all I suppose remember the substitution of bronze for copper, and are probably well acquainted with those now in use.

I have now given you a very imperfect and superficial sketch of the principal coins that have been in use for the last thousand years in this country. There are necessarily some I have omitted and changes in others which it would be tedious to enter into. There are, however, some coins or patterns which, though not issued, are most interesting. I shall mention three. The first is a six-angel piece, struck in the reign of Edward VI. The reverse bears a fine ship of that time (the original type of our late three-deckers), bearing a shield, behind which stands the king in something like due proportion, and other figures in the rigging. In design and execution this is perhaps the finest piece ever struck by the old system of hammering. Another piece is a die, engraved at Oxford by Rawlins for Charles, and is a die of a £5 piece. The king preserved it as one of the last acts of his sovereignty and on the scaffold presented it to Bishop Juxon. The enormous interest attached to this coin as a relic is shown by the fact that a gentleman gave 260 guineas for it at a sale, and his house was besieged by crowds of enthusiastic visitors to see it. It bears the motto "Florent concordia regna," peculiarly inappropriate to Charles' reign. The third is a pattern crown, produced by one Simon at the beginning of Charles II's reign. There was a contest between Simon and a John Rœttin of Antwerp as regards engraving, which was unfairly decided in favour of Rœttin. Simon then engraved a crown, perhaps the best ever issued, with the following petition on the edge: "Thomas Simon most humbly prays your majesty to compare this his tryal piece with the Dutch, and if more truly drawn and embossed, more gracefully ordered, and more accurately engraven, to relieve him." This petition was however not attended to.

The legends around them form, in my opinion, one of the most interesting parts of a collection of coins. In examining them the first thing that strikes us is that they are all Latin; the next, that more than half are religious. As instances of this I may mention on the gold 20s. piece of Charles I, "Exsurgat Deus, dissipentur inimici." This was struck during the war. I have already mentioned those on the groat and on the noble.

The half-angel of Edward IV bears "O crux ave, spes unica." "Redi cuique quod suum est" was put on nearly the basest money ever issued. Those that are not religious generally tell their own tale, as "Rosa sine spinâ," on the coins of Henry VIII: "Carolus a Carolo," on Charles Carolus. "Decus et tutamen," placed round the edge of the coin, as on that 40s. piece, (to prevent clipping) and others. To come to the kings' titles. Athelstane, in 927, was the first to style himself "Rex totius Brittaniæ." The Normans changed this into "Rex Angliæ." After John "Dominus Hiberniæ" was added. Edward III added "Dei gratiâ," which had been used on the seal since the conquest. He also called himself "Rex Franciæ," to which he had some claim. Henry VIII styled himself "Rex Hiberniæ," and James I. added "Scotiæ" and then altered it to "Rex Magnæ Brittaniæ, Hiberniæ, et Franciæ." George I. assumed "Fidei Defensor" and his German titles. You see that on the spade guinea the inscription runs thus—"Georgius Dei Gratiâ Magnæ Britanniæ, Franciæ et Hiberniæ Rex, Fidei Defensor, Brunovicensis et Lunenbergensis Dux, Sacra Romani Imperi Archithesaurus et Elector." George IV dropped the greater part of this, at last relinquishing the empty boast of King of France.

There are a few terms I should like to explain to you. The first is 'sterling.' It is probably derived from 'easterling,' a name given to persons who were appointed in Henry II's reign to make an annual examination of the mint at Easter, so that the term means true money according to the last examination. Another expression is 'Maunday money.' Maunday money is the money given away on Maunday Thursday, or the Thursday before Easter, to as many poor as the queen or king has years. The name probably comes from 'maund,' a basket, in which the doles, originally provisions, &c., were given away. Silver four-pennies, three-pennies, two-pennies, and pennies constitute the Maunday money. Tokens are generally of copper. They are coins issued by private individuals for small change, and are of all shapes and devices.

I shall now say a few words about coinage generally. Till the middle of the 15th century English coins were famous everywhere for purity and fineness. Then they began to decline; Henry VII. debased them from avarice, and Henry VIII to supply his extravagance. Edward VI. did a little towards reforming it, but the real work was left for Elizabeth. She first ordained that all the money should pass for its real value, thereby robbing the country, who only got 2½d. for what they had paid 12d. for. None but a Tudor could have dared on such a bold step. There was then issued a coinage, the real value of which scrupulously corresponded with the nominal rate. Charles did not debase the coinage throughout the civil war. But in William III's reign a great crisis took place. Until the reign of Charles II. the coins were struck by a very old process. The metal was divided by shears, stamped and rounded by hammers. Few pieces were exactly round, and the rims were not marked, so that, though clipping was

made high treason, still it prospered. After the restoration the mill was introduced. It is a machine worked by horse power, and was a great improvement, and moreover, as the pieces were round and lettered on the edge, they could not be clipped. These and the hammered coins were in circulation together, and as people were naturally in the habit of melting or sending abroad the new and infinitely more valuable coins, clipping continued to increase. William could not act like Elizabeth, and the distress was very great, especially among the poor who were paid in the old coin according to their supposed value, and had to pay according to their real value. Three goldsmiths were asked to send each £100 of current silver to be weighed. The £300 should have weighed 1200 ozs., but only weighed 624. £100 weighed at Bristol 240 ozs. instead of 400; 203 at Cambridge; 180 at Exeter; and 116 only, at Oxford. A guinea that had been bought by a Quaker for 22s. at Lancaster, increased in value at every stage and was worth 30s. in London. At last the day was fixed, after which the government would receive no more old money.

Great excitement prevailed, but at last, greatly to the joy of every one, the change was happily effected. The coinage then went on smoothly till George III's reign, when, owing to the negligence of the king in not issuing coins, great want was felt, so much so that silver tokens were issued by the banks, and Spanish dollars were stamped and made current. At last, in 1815, the king was compelled to issue a new coinage which was entrusted to Mr. Boulton, who had been so successful with the copper. His machinery was so good that hardly any improvements have been made in it, and it is perhaps the most perfect in the world. Clipping is now unknown. Macaulay tells a good story about the feeling against clipping. A clergyman, preaching before some condemned clippers said, as an aggravation of the crime: If the same question was put now as was put before, "Whose is this image and superscription?" we could not answer the whole question. The image we might guess at, but we cannot tell whose it is by the superscription, for that is all gone." The Irish coinage is chiefly notable for the way in which the English kings debased it, sending everything there that would not have been received here. In execution we have often been behind the continental nations, and especially in variety of designs, though we can boast of some of the best engravers, and our present coinage is decidedly the best. I have now only to thank those who have kindly lent me any coins, especially Mr. Sowerby.

There were 44 persons present:—1 hon. member, 18 members, and 25 visitors.

MEETING HELD DECEMBER 18TH, 1868.

The heads of sections gave their reports for the half-year.

A Chinese visiting card and 7½d. bank-note were presented by R. B. C. Everard, Esq.

Eggs of the Norfolk Plover, Rook (variety), Nightingale, etc., were presented by A. C. Almack, Esq., also a small collection of Fungi by the same.

EXHIBITIONS.

Some Celts from the plain of Marathon by F. Storr, Esq.

An ancient betrothal-ring by F. E. Thompson, Esq. A skull of Cat by E. Almack.

F. GILES then read the following paper on his

TRIP TO AMERICA.

We started from Liverpool, that city of docks and dirt, one fine day in August on board the Cunard packet "Africa," and dropping gently down the Mersey with the tide steamed out into the Irish Sea, past Anglesea, Penguin Island, and Holyhead. The next morning we entered the beautiful harbour of Cork and took on board the mails. On the east side of Cork Harbour stands a round tower which you may remember was taken by the Fenians a short time since while the 'custos' was sipping his tea. This is one of a comparatively small number, still standing in Ireland. The exact date of their erection is, I believe, uncertain, but they bear witness to a considerable amount of mechanical skill among the early Irish. They belong to the transitional period between Roman and Gothic art, and served as belfries, lighthouses, and towers of defence. Their symmetry is perfect; but the courses of rough stones which compose the most ancient of them have evidently owed little to the mason; their very form is probably due to the want of cranes, by which heavy weights might be raised, and skill to bridge a space. Dr. Petrie has conjectured that they were originally isolated bell-towers to churches, which, owing to their inferiority in solidity and completeness of architecture, have long since perished. It may be observed that the isolation of the bell-tower from the church is customary in Russia, not uncommon in Italy, and sometimes met with in England. Leaving Cork Harbour we steamed past Kinsale and Cape Clear and soon lost sight of land. We now began to settle down and choose our friends among our fellow passengers. They were a study in themselves. Our captain was a most excellent seaman and the most polite of men on shore, but as soon as he put his foot on his own deck he became as silent as a stone. Among our fellow-passengers were a Northern family returning from Switzerland, where the sons had been educated, a Nova-Scotian Clergyman, a Scotch doctor, a newly appointed governor going out to his colony, a romantic young couple who were to be married as soon as they reached Halifax, and

last but not least old Chief Justice Haliburton, the author of Sam Slick. The excellent old gentleman with any but his intimate friends was as taciturn as the captain himself, but my father knowing him very well, I had the rare pleasure of hearing conversation fraught with such humour as one would expect from the author of Sam Slick. The old gentleman too had the state-cabin opposite us and having a great objection to close air used to amuse me very much by turning out bare-legged in his night-shirt and a most extraordinary nightcap, at about four o'clock every morning, and roundly abusing the stewards for half-stifling us by shutting all the deck windows. He is now dead :—a better hearted man never breathed.

Our passage was exceedingly stormy occupying 14 days instead of the usual 8 or 9. The main deck was generally 2 or 3 inches under water and we actually had some pipe-fish washed on board. When nearing Newfoundland we saw five icebergs, and immediately afterwards entered a dense fog through which we steamed at half speed for 48 hours, with a most doleful steam whistle striking up at intervals of about 2 minutes' duration. This was decidedly unpleasant, for the fog was so thick that we could not see half the length of the deck before us, and if we had run into one of the icebergs we had just seen there would have been an end of the good ship *Africa*, and it would never have been my lot to weary you this evening.

In a paper read to the Natural History Society I may perhaps be allowed to make some digression here in order to give a slight account of the phenomena of icebergs.

Icebergs then are formed in three ways

First, by glaciers decending to the shore and being borne seawards by land winds. These glaciers bear on their surface portions of moraines and blocks of rock, and sand, and mud, enclosed in their sides and which had been carried off by friction from the walls which bounded them. The glacier descends to the sea, huge masses are broken off with their enclosed boulders, and float away as majestic icebergs.

Secondly, by River ice packed during spring, when the upper reaches of the river begin to thaw. In Canadian rivers, for instance, the rivers become solidly frozen over, and if the frost be intense enough, a cake of ice forms at the bottom, enclosing the sand, mud, and rocky fragments strewn over the banks or channel of the stream. When the spring sets in and the upper part of the river begins to thaw, the swollen waters burst their covering of ice and the ice is then said to *pack*. Layer is pushed over layer and mass heaped upon mass, until great floes are formed. These are borne out into the sea by the current and then gradually melt away as they float southwards.

Thirdly, by the freezing of the sea itself. This takes place in the open sea when the temperature falls to 28°, but in inland brackish seas ice forms

along the coast. This fringe is broken off by wind or tide, and often returns to the coast, packing over ice which has formed there; the whole mass finally floats out to sea; and icebergs 200 or 300 feet high are sometimes produced in this way.

I cannot give a more vivid description of the appearance of an Iceberg than that contained in the following passage taken from Mr. Geikie's "Story of a Boulder."

He says, "Few sights in nature are more imposing than that of the huge solitary iceberg, as, regardless alike of wind and tide, it steers its course across the face of the deep far from land. Like one of the Frost Giants of Scandinavian Mythology, it issues from the portals armed with great blocks of stone. Proudly it sails on. The waves that dash in foam against its sides shake not the strength of its crystal walls, nor tarnish the sheen of its emerald caves. Sleet and snow, storm and tempest are its congenial elements. Night falls around, and the stars are reflected tremulously from a thousand peaks, and from the green depths of 'Caverns measureless to man.' Dawn again rises, and the slant rays of the rising sun gleam brightly on every projecting crag and pinnacle, as the berg still floats steadily on; yet as it gains more southern latitudes, what could not be accomplished by the united fury of the waves, is slowly effected by the mildness of the climate. The floating island becomes gradually shrouded in mist and spume, streamlets everywhere trickle down its sides, and great crags ever and anon fall with a sullen plunge into the deep. The mass becoming top heavy, reels over, exposing to light rocky fragments still firmly imbedded. These, as the ice around them gives way, are dropped one by one into the ocean, until at last the iceberg itself melts away, the mists are dispelled, and sunshine once more rests upon the dimpled face of the deep. If, however, before the dissipation, the wandering island should be stranded on some coast, desolation and gloom are spread over the country for leagues. The sun is obscured, and the air chilled; the crops will not ripen, and to avoid the horrors of famine the inhabitants are fain to seek some more genial locality until the ice shall have melted away: and months may elapse before they can return again to their villages."

Only about $\frac{1}{8}$th of the real bulk of an iceberg is seen above the water, and some have been seen rising 300 ft. above the sea which must therefore, if their submarine portions sank to the maximum depth, have reached the enormous total height of 2700 ft.

Before we emerged from the fog we smelt the peculiar odour of the pine forests and shortly after the mist cleared away and about 20 miles distant we saw the dark green hills of Nova Scotia.

Another couple of hours saw us moored to a wharf in the noble harbour of Halifax and busy getting our traps ready for a landing. We got to an inn as speedily as possible and then began to look about us. The harbour is very

spacious and well sheltered. It contains an outer and an inner (known as the Bedford) Basin. This latter basin extends for 10 miles past the city, and both are very deep. The city is built on the slope of a hill on the top of which stands Fort George, called by the Blue noses (Nova Scotians) the Citadel. The houses are mostly of wood, the streets being broad and well laid out. Here are the province buildings of Nova Scotia containing the meeting house of the Legislative Assembly of the province.

We stayed at Halifax for some days and during our walks frequently met groups of Mic-Mac Indians who had their wigwams at the head of the bay. Their queen wore a sort of bag of black cloth open at two of the sides and covered with beads. This I suppose answered to our idea of a crown.

These Indians are in a very miserable state and are fast dying out. In British North America there existed in 1861 about 140,000 of them belonging to nine or ten families. It sounds strangely, but it is a fact that one tribe, the Chippewas, have, or had lately in Canada West, a newspaper of their own, entitled Petubaum, or Peep of Day.

From Halifax we went by rail to Windsor on the Bay of Minas, on which bay Longfellow, it will be remembered, has laid the scene of his Evangeline. Thence we went by coach to Annapolis. Close to this place is Digby the great Station for the smoking of herrings, and whence come, I believe, a very large proportion of our Yarmouth bloaters. We visited one of the smoking huts and saw countless herrings hanging among the rafters, undergoing a gradual smoking process.

We took steamer from Annapolis to St. John, the capital of New Brunswick, and on this boat we for the first time met some real Yankees, the British North Americans being as a rule almost as British as we are ourselves. The people of Canada South are an exception to this. They resemble provincial French. French is the language they speak and even the cautions on the railroad are written in French. These Yankees were very cute fellows, and invested in fish at Annapolis which they intended to sell at a profit in St. John's guessing they would *clar* their passage over by the transaction.

St. John's is a larger city than Halifax, and contains large steam saw mills which cut up the logs floated down the river from the forests on its banks. The city stands at ths head of the Bay of Fundy, and one gets a capital idea there of the wonderful rise of the tide in that inlet. Where the river enters the harbour there occurs a vertical wall of rock; large vessels go up the river over it at high water though when the tide is out there is a considerable cascade at this point. The great rise of the tide is due to the currents sweeping up the coast of the States and entering a sort of *cul de sac* between Nova Scotia and New Brunswick. The phenomenon known as the Bore is a wave some feet in height which sweeps up the river flowing into the bay, heralding the advance of the tide and swamping everything it meets in its course. The waters of the

bay are of a light yellow colour owing to the enormous quantity of muddy sediment afloat in them; this mud they deposit on the banks of the tributaries of the bay and the farmers cart it away when the tide falls and use it as manure for their land, for which purpose it is found to answer admirably.

At St. John's we took steamer and passing down the bay of Fundy stopped at Portland, got on the Grand Trunk Railway and after a 15 hours' run through Maine, New Hampshire and Vermont we crossed the St. Lawrence by the Victoria Bridge and found ourselves in Montreal.

We did not stop here on this occasion, but, as we made some stay in the place on our way back, it may be as well to give a slight description of it. Montreal, then, is situated on an island of the same name, at the foot of the Royal mountain, from which it takes its name near the confluence of the Ottawa and St. Lawrence Rivers. The city is a fine one, especially remarkable for its lines of quays; it is separated from the St. Lawrence by a broad terrace faced with stone, erected to protect the place from the breaking ice in spring time, which packs in the way previously mentioned into enormous masses, and which, were it not for the terrace would rise above the bank of the river and crush the adjoining houses. The quays are connected with a fine canal called the Lachine canal made to avoid the Lachine rapids just above the city. The city has been much damaged by fire at various times but contains many fine buildings, the most noticeable is perhaps the larger Catholic Cathedral.

The view from the Royal Mount behind the city is very fine. One looks down on the white houses and spires of the town, edged round by a wall of quays and a forest of masts; beyond, runs the broad St. Lawrence its face dotted with small craft, while a long black line running across it marks the Victoria Bridge and the eddying currents and foam above the city indicate the Lachine rapids, down which a long light-coloured body may be seen every now and then to dart, in fact a lumber raft, while still higher up the low Indian village of La Croix catches the eye, and beyond all spreads the flat surface of the country forming the opposite bank.

The Victoria Bridge is perhaps the most magnificent work of its class in the world. It is within a few yards of 2 miles in length. It is tubular and consists of 24 spans the centre one having a width of 330 feet. The whole cost amounted to about 2½ millions sterling. The great difficulty in building it was to provide efficient resistance against the enormous weight of ice coming down the river in spring. This was accomplished by constructing buttresses in the shape of a right angled triangle on the upper side of the bridge, the hypotenuse sloping down into the water.

From Montreal we travelled another 15 hours by the Grand Trunk till we reached Toronto, situate at the west end of Lake Ontario. The scenery along the line between these two places altogether defies description. The railway

runs along the northern bank of the broad St. Lawrence for miles and miles. Perhaps the most exquisite piece of scenery on the journey is that afforded by the narrow end of Lake Ontario just were the St. Lawrence flows out of it. This part of the lake is called 'The lake of the Thousand Isles,' and is covered with islets of a most beautiful emerald green colour and ranging in size from 10 miles in length to mere specks upon the water.

Excellent fishing is to be found in the lake, the greatest prize to the fisherman being of course the magnificent sturgeon.

Toronto is nowise remarkable save for its educational institutions and an excellent museum of Natural History belonging to its University.

At Toronto we left the Grand Trunk and taking the Great Western of Canada we skirted the western end of lake Ontario and passing through Hamilton, a favourite Station of army men, at length arrived at the falls of Niagara which we had determined to make the limit of our progress westward.

We heard the dull roar of the Falls (Niagara is an Iroquois word and means Thunder of Waters) from some considerable distance but as we arrived late in the evening, we took a room at the Clifton Hotel, close to the Falls, on the Canadian side, and did not venture out till next morning.

Our first view of the falls was on the whole disappointing, the height is insignificant, only about 160 feet; their enormous breadth and the immense volume of water pouring over them constitute their true grandeur, and these features do not attract the attention at first sight. The more closely they are observed, however, the grander do they appear, until after two or three inspections one goes away convinced that loudly as they are praised, the praise is all too feeble for their magnificence; of the immense volume of water coming over the falls some idea may be formed when we consider that the Niagara River affords an exit for the waters of lakes which cover an area nearly equal to that of one half the fresh water lakes of the world put together.

*The river flows over a flat table land, in a depression of which Lake Erie is situated. Where it issues from the lake it is nearly a mile in width, and 330 feet above Lake Ontario, which is about 30 miles distant. For the first fifteen miles below Lake Erie the surrounding country, comprising Upper Canada on the west, and the State of New York on the east, is almost on a level with its banks, and nowhere more than 30 or 40 feet above them. The river being occasionally interspersed with low wooded islands, and having sometimes a width of three miles, glides along at first with a clear, smooth, and tranquil current, falling only fifteen feet in as many miles, and in this part of its course resembling an arm of Lake Erie. But its character is afterwards changed on approaching the Rapids, where it begins to rush and foam over a rocky and uneven limestone bottom, for the space of nearly a mile, till at length it is thrown down perpendicularly 165 feet at the Falls.

* Lyell's Principles of Geology.

Here the river is divided into two sheets of water by an island, the largest cataract being more than a third of a mile broad, the smaller one having a breadth of 600 feet. When the water has precipitated itself into an unfathomable pool, it rushes with great velocity down the sloping bottom of a narrow chasm, for a distance of 7 miles. This ravine varies from 300 to 400 yards in width from cliff to cliff; contrasting therefore strongly in its breadth with that of the river above. Its depth is from 200 to 300 feet and it intersects for about 7 miles the table land before described, which terminates suddenly at Queenstown in an escarpment or long line of inland cliff facing Northwards, towards Lake Ontario. The Niagara, on reaching the escarpment and issuing from the gorge, enters the flat country, which is so nearly on a level with Lake Ontario, that there is only a fall of about 4 feet in the seven additional miles between Queenstown and the shores of the lake.

The island dividing the Falls is called Goat Island, and here civilisation exerts its sway for the visitors to the Falls find it an elegant spot for picnics. This island is connected with the American side by a bridge crossing the American falls.

These American falls constitute the smaller of the two cataracts. They are some 5 feet higher than the larger or Canadian falls, but they are far less in width and volume, and do not descend sheer into the river below, but fall on huge boulders of rock heaped up in inextricable confusion at their base.

The Canadian Falls occur between Goat Island and the Canadian Bank of the river. They extend for some little distance from either edge, in a straight line, but near the centre form a horseshoe-shaped curve, the bend pointing up the river. This part of the fall goes by the name of the Horseshoe Fall, and it is from this point that the main body of water is shot clear off the rock into an unfathomable pool below. Clouds of spray several hundred feet high continually envelope the falling water, and when the sunbeams fall on them, the most beautiful rainbows are produced. This spray extends to such a distance that the atmosphere is damp and the wooden palisadings of the fields for some distance round are continually rotting away. It is possible to get behind the extreme edge of the falls on the Canadian side but the ever-falling spray makes the narrow pathway of rock a very insecure foothold and a single false step would send the unwary sight-seeker to another world.

Immediately below the falls on the Canadian bank comes the well-known Table Rock, a crystalline mass formed from the same limestone as that which lines the bed of the river above the falls. Here again irrepressible civilization manifests itself; while looking down at the magnificent Horseshoe Fall, we perhaps hear a voice addressing us and turning round, "*Lo the poor Indian offering his wares.*" If at length overpowered by the grandeur of the spectacle (of the Falls, not the Indian), we turn away in reverie, we run against a sign

board directing us to an adjoining bazaar (as conventional a specimen as any in Brighton) where *"polished rock and Indian slippers may be had at all prices!"*

But the falls of Niagara are not only interesting to the sight, seekers, they also afford a magnificent example of the power of rivers, in the excavation of a deep valley out of solid rock. It may be as well to examine them geologically.

*It has long been believed that the Niagara once flowed in a shallow valley across the whole platform, from the present site of the falls to the escarpment called the Queenstown Heights, where it is supposed that the cataract was first situated, and that the river has been slowly eating its way backwards through the rocks for the distance of seven miles.

This view is naturally suggested by the narrowness of the gorge at its termination, and throughout its whole course, as far up as the Falls, above which point the river expands as before mentioned. The boundary cliffs of the ravine are usually perpendicular, and in many places undermined on one side by the impetous stream. The uppermost rock of the table-land at the Falls consists of hard limestone (a member of the Silurian series), about 90 feet thick, beneath which lie soft shales of equal thickness, continually undermined by the action of the spray which rises from the pool into which the water is projected, and is driven violently by gusts of wind against the base of the precipice. In consequence of this action and that of frost, the shale disintegrates and crumbles away, and portions of the incumbent rocks overhang 40 feet, and often, when unsupported, tumble down, so that the Falls do not remain absolutely stationary at the same spot, even for half a century. Accounts have come down to us, from the earliest period of observation, of the frequent destruction of these rocks; and the sudden descent of huge fragments in 1818 and 1828, are said to have shaken the adjacent country like an earthquake. The idea therefore of perpetual and progressive waste is constantly present to us as we look at the falls; and as that part of the chasm, which has been the work of the last 150 years resembles precisely in depth width and character, the rest of the gorge, which extends 7 miles below, it is most natural to infer that the entire ravine has been hollowed out in the same manner, by the recession of the cataract.

Lyell allows 35,000 years for the retreat of the Falls from the escarpment of Queenstown to their present site, calculating the recession to be about one yard a year. But this question of time is a very difficult one as the speed must have varied with the height of the precipice, the hardness of the materials at its base, and the quantity of fallen matter to be removed. At some points it may have receded faster than at present but in general its progress was probably slower, because the cataract, when it began to recede, must have been nearly twice its present height.

* Lyell's Principles of Geology.

I have forgotten to mention the whirlpool; this occurs some distance below the Falls and may be accounted for by the supposition of a barrier of hard rock raising its head from the bottom of the river, in opposition to the water sweeping down from the Falls.

People have speculated on the deluge that might be occasioned by the sudden escape of the waters of Lake Erie, if the ravine should ever be prolonged backwards, but a recent geological survey has shown that the Falls would diminish gradually in height before they had travelled back two miles, and in consequence of a gentle dip of the strata towards the south, the massive limestone now at the top would then be at their base, and would retard, and perhaps put an effectual stop to the excavating process.

The locality is made interesting to engineers by the splendid Buffalo Suspension Bridge which crosses the Niagara about ¼ of a mile below the falls Over the river at this point, and not, as some suppose, over the Falls, Blondin was fool-harday enough to walk on a tight-rope, much to the edification, no doubt, of those who saw him.

We were at the Falls during the American Civil War, and numbers of ruffians had come across the river to escape the conscription; these fellows filled the Clifton House, the hotel at which we were stopping; they had social "liquorings-up" in the evenings, and I think knives were drawn almost every night we were there.

After leaving Niagara we returned to Halifax by the way we had come, save that we went over land from St. John to Halifax and witnessed between these places a most magnificent dense storm cloud rolling down the slopes of the Cobequid mountains; the cloud looked perfectly solid, and was of a brown grey colour; its appearance was most majestic as it came sweeping with resistless might down the mountain side.

At Halifax we stayed some time before embarking, and while there visited the gold mines at Waverley, some 12 miles off. These mines are some of several now worked in the auriferous district of Nova Scotia which extends for 250 miles along the coast and from eight to thirty five miles in land.

This district consists of a metamorphic limestone containing 5 or 6 bands of auriferous quartz running nearly paralled to the Atlantic sea-board of the Province. Each band consists of numerous veins and "leads?" which vary in thickness from a fraction of an inch to several feet. They are of various degrees of hardness and richness, and at various depths from the surface.

Generally the quartz rock is hard, and yields slowly to abrasion, or the action of frost. In some places the veins are folded and otherwise distorted; in others they follow the windings of the subjacent and overlying rocks. In a few places auriferous drifts, the result of the disintegration of pre-existing quartz veins, and decomposed rocks, afford 'alluvial' or 'placer' diggings, but

not, so far as they are known, of sufficient richness and extent to warrant operations on a large scale.

The gold in the quartz bands is not very abundant, one oz. of gold to a ton of quartz, I think the manager at Waverley told us, was the average yield. The quartz is got out by sinking shafts along the course of the vein; the miners descend these and quarry out the quartz in small blocks, which are thrown out at the mouth of the shaft, till the miner in one shaft meets the miner working in the next, a fresh shaft is then sunk further along the line of the vein. The blocks round the mouth are carted away to the crushing mill, where they are thrown into vessels in which work stampers, like the instrument so fatal to shirt buttons in our laundry, but made of iron, and of great weight. These stampers reduce the blocks to sand which is washed over several inclined boards at the ends of which are placed basins of quicksilver; the particles of gold gravitate through the grains of sand and are received in the quicksilver bowls which are, after a time, removed, and the quicksilver is then separated from the gold by straining through wash leather.

Our passage home was a fine one, and we had a good view of the iron-bound coast of Newfoundland.

I cannot quit my subject without directing attention to the extreme natural richness of British North America in almost every respect.

Our geologists and mineralogists would find sufficient occupation for an unlimited number of half-years among its gold, silver, copper, iron ore, galena, plumbago, limestone, and marble. Extensive petroleum wells and lime springs are found. The coal fields are very extensive; perhaps the most curious seam is that of the so-called Albertite coal, formed in Albert county, New Brunswick. It is a bituminous deposit yielding 100 gallons of oil to the crude ton. It will be remembered that it was in the coal fields of Nova Scotia that Sir Charles Lyell and Mr. Dawson confirmed the "growth" theory of coal formation by collecting more direct proofs than had yet been obtained of the growth of the coal plants on the underlying fire-clay. Here, too, Sir Charles Lyell settled the dispute about the atmosphere of the carboniferous deposits, by finding the shell of a small Pupa, an air breather, inside the stem of a tree called a *Sigillaria*.

The Botanist, too, would find in British North America, maples (from which sugar and cabinets are made), birches, (producing the Bark for the Indian's canoe and wigwams, excellent wood for ship building, handling agricultural implements, &c., and a certain instrument of torture we have heard of), oaks and beeches (used in an infinite number of ways), ashes (for making oars and baskets), elms, (for making chair bottoms), butternuts and walnuts, (used for cabinet work), hickories, poplar and willows (used by sleigh and basket-makers), cherry, plum, thorn, strawberry, raspberry, blackberry, cranberry,

elder, sumach, sassafras, sycamore, and last but most numerous and most important the various pines, cedars, and spruces.

Among the fauna are bears, wild cats, wolves, red and silver-gray foxes, wolverines, racoons, weasels, moles, bats, martens, otters, cariboo, moose, beavers, porcupines, squirrels, and innumerable birds, the most noticeable being eagles, hawks, owls, woodpeckers, grouse, pigeons, bitterns, snipe, woodcock, and wild ducks and geese.

The fisheries are very important, the most extensive being the cod, mackerel, herring, and shad fisheries. Salmon of large size are found in almost all the Nova Scotian rivers.

I must apologise for having made my digressions on geological subjects alone, a fault which will, I hope, be excused, on the score of my utter ignorance of any other branch of science studied by this society.

It only remains for me to thank you for the attention with which you have listened to a very tedious paper.

After which the Rev. F. W. Farrar, F.R.S., who was a visitor, gave an interesting account of the working of the Harrow Scientific Society of which he is President.

A. C. Almack, Esq. then addressed a few words of advice to the Society.

After which the President having urged upon the Society the immense benefit to be derived from noting down the most ordinary observations connected with Natural History, the meeting was adjourned.

There were 49 persons present: 3 Hon. members, 15 members, and 31 visitors.

ENTOMOLOGY.

Great care has been taken to notice every little thing that may prove of interest to an observer, such as the latest appearance of insects, &c. Full particulars of any important captures will be found in the Notes at the end of the List; also, where thought needful, a comparison has been made between the dates of 1868 and 1867.

As usual, * signifies "new to the Locality."

Names of those whose initials occur in the following list:—

E.G.B.	E. G. Barrow
F.J.C.B.	F. J. C. Boles.
C.M.B.	C. M. Bull, Esq.
J.M.C.	J. M. Chapman.
H.C.	H. Chichester.
C.J.C.	C. J. Cole.
F.M.D.	F. M. Dickson.
J.B.F.	J. B. Fuller.
C.F.H.	C. F. Harrison.
H.G.H.	H. G. Haynes.
A.B.H.	A. B. Hervey.
A.C.H.	A. C. Hilton.
H.M.H.	H. M. Hilton.
F.J.H.J.	F. J. H. Jenkinson.
W.H.M.	W. H. Macdonald, Esq.
G.E.M.	G. E. Manisty.
C.G.H.M.	C. G. H. Mann.
J.B.O.	J. B. Oakeley.
W.J.P.	W. J. Pratt.
A.H.B.R.	A. H. B. Reynardson.
S.A.R.	S. A. Rogers.
H.St.G.R.	H. St. G. Richardson.
H.S.S.	H. S. Sankey.
J.S.	J. Sharp.
F.S.S.	F. S. Shelley.
C.A.S.	C. A. Sladen.
E. im T.	E. im Thurn.
T.J.V.	T. J. Verrall.

RHOPALOCERA.

Gonepteryx Rhamni	Brimstone	Sep. 17 Oct. 11	rather late	J.M.C. J.S.
Colias Edusa	Clouded Yellow ...	Aug. 28	Abundant	J.B.O.,S.A.R. C.M.B.
Lasiommata Ægeria	Speckled Wood ..	Sep 1,10	Very late	H.M.H., A.H.B.R., H.S.S.
Cynthia Cardui ...	Painted Lady ...	Aug. 16 Oct. 31	2nd brood late ...	H.M.H., A.C.H.,J.M.C.
Vanessa Atalanta ...	Red Admiral ...	Nov. 1	late ...	...
V. Urticæ	Tortoise-Shell ...	Nov. 1	late ...	...H.M.H.
Chrysophanus Phlæas	Small Copper ...	Oct. 20	very late	...H.M.H.
Polyommatus Agestis	Brown Argus ...	Aug. 15	2nd brood	J.B.F.

HETEROCERA.

Sphingina

Smerinthus Populi	Poplar Hawk ...	Aug. 26	larva	...C.A.S.
S. Tiliæ	Lime Hawk ...	Aug. 25	do. ...	...A.H.B.R.
Sphinx Convolvuli	Convolvulus Hawk	Aug. 24	Sep. 16	...
S. Ligustri	Privet Hawk ...	Aug. 15	larva	...H.G.H. F.S S.
Deilephila Livornica	Striped Hawk ...	about Sept. 4		
MacroglossaStellatarum	Humming Bird H.	Oct. 24	latest app.	E. im T.

Bombycina

Cossus Ligniperda ...	Goat Moth	Sep. 20	larva	...A.B.H.
LophopteryxCamelina	CoxcombProminent	Aug. 27		A.C.H., H.M.H.
DilobaCæruleocephala	Figure of 8	Aug. 28	bred ...	...C.A.S.
Pygæra Bucephala ...	Buff-tip	Aug. 18	larva	...A.H.B.R.&c
Dasychira Pudibunda	Pale Tussock	Sep. 4	larva	...C.F.H.,&c.
Orgyia Antiqua ...	Vapourer	Aug.16	20 days earlier	H.M.H., A.C.H.

Noctuina.

Acronycta Psi ...	Dagger	Aug. 18	(larva)	...H.M.H.,— A.H.B.R.
A. Megacephala ...		Sep. 18		E.im T.
Leucania Impura ...	Dark Wainscot ...	Aug. 26		F.J.C.B.
*L. Pallens	Wainscot	Sep. 1	very common	F.J.H.J.
*Gortyna Flavago...		Sep. 21		W.H.M.
Heliophobus Popularis	Feathered Gothic	Aug. 17		W.J.P.
Mamestra Brassicæ...	Cabbage Moth ...	Aug. 18		C.J.C.
Caradrina Cubicularis		Aug. 20	common	...H.M.H.

*Agrotis Festiva		Aug. 19	at light	...F.J.C.B.
		Sep. 27	latest app.	H.M.H.
A. Suffusa		Aug. 18	8 days earlier	F.J.H.J.
A. Segetum		Aug. 19		A.C.H.,—H.M.H.
Noctua C.-nigrum...		Aug. 26		H.C.
Phlogophora Meticulosa	Angle-shades	Aug. 30		S.A.R.,—G.E.M.
Plusia Chrysitis ...	Burnished Brass...	Sep. 5	late ...	...C.A.S.,—J.M.C.
Amphipyra Tragopogonis	Mouse	Aug. 24		F.J.H.J.
Mania Typica		Sep. 5		W.H.M.
GEOMETRINA				
Ourapteryx Sambucaria	Swallow-tail M...	Aug. 30		C.G.H.M.
Strenia Clathrata ...	Latticed Heath ...	Aug. 20		F.J.H.J.
Minoa Euphorbiata...		Aug. 15	2nd brood	J.B.F.
Ypsipetes Elutata ...		Aug. 19		A.C.H.,—H.M.H.
Melanippe Biriviata...	Dark Carpet ...	Aug. 4	late ...	...H.St.G.B.,—E.G.B.—F.M.D.
M. Fluctuata	Common Carpet...	Aug. 19		F.J.H.J.
Coremia Ferrugaria...		Aug. 19		F.J.H.J.,—H.M.H.
Cidaria Russata ...		Sep. 5	late ...	...T.J.V.
PTEROPHORINA.				
Pterophorus Pterodactylus		Sep. 4		H.M.H.,—H.G.H.
Alucita Polydactyla...		Sep. 23		F.J.H.J.

An attempt has been made to procure a list of Lepidoptera taken at or near Marlborough during the Midsummer Holidays. At present only the following have been obtained :—

Apatura Iris... ...	Purple Emperor	Savernake Forest
Vanessa Antiopa...	Camberwell Beauty ...	In Savernake Forest
Chærocampa Celerio		

These captures in former years have been communicated by Mr. W. J. Baverstock. This year, there have been taken by C. A. Sladen at Alton Barnes,

Hipparchia Semele	Grayling...	July 25.
Polyommatus Corydon	Chalk-hill Blue	July 16.

Odonestis Potatoria	**Drinker ... ...**	**July 3.**
Triphæna Janthina	**... ... ...**	**July 18.**
Stauropus Fagi ...	**Lobster ... ...**	**June 30.**

This last was taken by Mr. J. Velvin in one of the rooms of the College.

August.—When the School returned, the Insects generally noticed at that time could not be found. This can be attributed to the extreme earliness of the Season this year, and to the heavy rain and cold wind, which succeeded the hot and dry Summer. There were, however, some good captures :

(i) *S. Convolvuli*—One specimen taken at Tottenham, Aug. 31, and a second found at rest on a door in the Town, Aug. 25.

(ii) *Agrotis festiva*—Taken at light by F. J. C. Boles. This insect is commonly taken at sugar. It is to be hoped that some arrangements will be made to enable the members of the section to adopt this plan of capturing moths, in which case the List of Noctuæ will be considerably increased.

(iii) *L. Camelina*, taken at Aldbourne by A. C. and H. M. Hilton.

The other captures this month appear in the List. Of *Colias Edusa* it may be remarked that the specimens, though plentiful, occurred only singly, and generally in gardens.

September.—The great capture this month was a specimen of the Striped Hawk (*D. Livornica*), on the 14th.* It was found by two little girls in a stubble-field, near the Railway Station. They took it to a bird-stuffer, who almost entirely spoilt it by cutting off its tail and stuffing the inside with cotton wool, saturated with turpentine. A specimen of this insect, in fine condition, was presented to the Society by F. E. Thompson, Esq. It was captured in Kensington, near London, on 27th August.

A third specimen of *S. Convolvuli* was captured on the Bath Road by a boy in the Town.

L. Pallens was taken for the first time. It is extraordinary that it had never been captured here before by any member of the School.

G. Flavago was also a new addition to our List. It was taken by W. H. Macdonald, Esq.

The Speckled-wood Butterfly *(L. Ægeria)* was observed as late as Sep. 15th by H.M.H. and A.H.B.R. in Manton Copse, and *A Festiva* as late as the 27th. Specimens of the Copper Butterfly *(C. Phlœas)* might have been observed throughout the month.

October.—Not much was done; the weather being very unfavourable. A stray Red Admiral or Painted Lady might be seen occasionally.

* This specimen may have been taken as early as Aug. 26th.

November.—The last specimens of the Red Admiral and small Tortoise-shell, which were observed this year, were seen on Nov. 1st, that day being unusually hot for this time of year.

December.—A fine specimen of the Peacock Butterfly, apparently fresh from the the Chrysalis, was found on Dec. 6th by S. Featherstone, Esq.

H. M. HILTON,
Head of the Section.

GEOLOGY.

Considerable activity has been evinced by the members of this Section during the past half-year. Meetings have been held fortnightly in the Museum. Attempts have been made to collect information concerning the quarries of the neighbourhood and the fossils to be found in them. Excursions have been made to Oare Hill and the Valley of Rocks, on which occasions Mr. Dixon very kindly explained the denudation of the Pewsey Vale and the theory of the Grey Wethers.

The following papers have been read at the meetings:—

On the Formation of Valleys, by W. E. Mullins, Esq.
On the Mollusca generally, by Rev. J. F. Bright.
On the Gasteropoda, by F. Giles.
On the Cephalopoda, by W. H. Macdonald, Esq.

Members of the section have also classified the fossils in the collection of the Society, the various strata being apportioned as follows:—

To W. E. Mullins, Esq.	The Tertiary Rocks.
„ W. H. Macdonald, Esq. ...	The Oolitic Series.
„ F. Giles	The Cretaceous Series.
„ G. E. Manisty	The Liassic Series.
„ E. Almack and H. J. Verrall	The Carboniferous Series.
„ J. A. Jeffreys	The Silurian Series.

Several exhibitions have been made, at the meetings, of fossils found by members of the section during the half-year; the most important discovery of fossils having been made by W. H. Macdonald, Esq., who came across several cretaceous fish in a quarry near Swindon.

Such is a brief record of the doings of the section, and we cannot close our report without thanking Messrs. Bright, Dixon, Mullins, and Macdonald, for the assistance they were always so ready to offer, and to which it is no exaggeration to say the Section owes its very existence.

F. GILES.

CATALOGUE OF BIRDS IN THE SOCIETY'S COLLECTION.

Kestrel, 1 skin, 2 stuffed.
Sparrow hawk, 2 stuffed.
Marsh Harrier, stuffed.
Hen Harrier, stuffed.
Barn Owl, 1 skin.
Short-eared Owl, 1 stuffed.
Tawny Owl, 1 skin.
Red-backed Shrike, 1 skin.
Night-jar, 2 stuffed.
Missel-Thrush, 2 stuffed.
Fieldfare, 2 stuffed.
Song Thrush, 3 stuffed.
Redwing, 1 stuffed.
Blackbird, 1 skin.
Ring Ouzel, 1 stuffed.
Red-breast, 1 skin.
Brambling, 3 skins.
Chiff-Chaff, 1 skin.
Bluethroated Warbler, 1 skin.
Redstart, 1 skin, 1 stuffed.
Gold crest, 1 skin.
Long-tailed Tit, 1 skin.
Pied Wagtail, 4 stuffed.
Meadow Pipit, 1 stuffed.
Snow Bunting, 1 skin, 1 stuffed.
Chaffinch, 2 skins.
House Sparrow, 2 skins.
Hedge Sparrow, 2 skins.
Bullfinch, 1 skin.
Greenfinch, 1 skin.
Hawfinch, 2 stuffed.
Yellow-hammer, 1 skin, 1 stuffed.
Siskin, 2 stuffed.
Linnet, 1 skin.
Mountain Linnet, 2 skins.
Starling, 2 skins.
Rook, 1 skin, 1 stuffed.
Raven, 1 skin.
Hooded Crow, 2 skins.
Magpie, 2 stuffed.
Jay, 2 skins.
Great spotted Woodpecker, 2 stuffed.
Green Woodpecker, 2 skins, 1 stuffed.
Lapwing, 1 skin.
Wren, 1 skin.
Hoopoe, 1 skin.
Nuthatch, 1 skin, 1 stuffed.
Cuckoo, 1 skin, 1 stuffed.
Bee-eater, 1 stuffed.
Kingfisher, 1 skin, 2 stuffed.
Swallow, 1 stuffed.
Martin, 1 stuffed.
Swift, 1 stuffed.
Pheasant, 4 stuffed.
Red-legged Patridge, 2 stuffed.
Quail, 2 skins, 2 stuffed.
Golden Plover, 1 skin.
Ringed Plover, 2 skins.
Stilted Plover, 1 stuffed.
Peewit, 1 stuffed.
Wood pigeon, 1 skin.
Turnstone, 2 skins.
Oyster Catcher, 1 skin.
Heron, 1 stuffed.
Bittern, 1 stuffed.
Curlew, 1 stuffed.
Redshank, 2 skins.
Common Sandpiper, 1 stuffed.
Ruff, 1 stuffed.
Reeve, 1 stuffed.
Common Snipe, 2 skins.
Jack Snipe, 1 stuffed.
Dunlin, 2 skins.
Purple Sandpiper, 2 skins.
Grey Phalarope, 1 stuffed.
Landrail, 1 skin, 1 stuffed.
Water-rail, 1 stuffed.
Moorhen, 1 skin, 1 stuffed.

Coot, 1 stuffed.
Pintail Duck, 1 stuffed.
Scoter, 2 skins.
Redbreasted Merganser, 2 skins, 1 stuffed
Great Northern Diver, 1 skin.
Common Guillemot, 2 skins.
Black Guillemot, 3 skins.
Puffin, 2 skins.
Razor Bill, 2 skins.
Cormorant, 1 skin.
Arctic Tern, 1 skin.
Common Gull, 1 skin, 1 stuffed.
Herring Gull, 2 skins.
Lesser Black-backed Gull, 2 skins.
Greater Black-backed Gull, 1 skin.
Stormy Petrel, 1 skin, 1 stuffed.
Great spotted Kingfisher, 1 stuffed

95 different species.
88 skins, 67 stuffed.

LIST OF EGGS IN THE SOCIETY'S COLLECTION.

Grasshopper Warbler, 1.
Sedge Warbler, 3.
Reed Warbler, 5.
Nightingale, 4.
Black-cap Warbler, 4.
Garden Warbler, 10.
Robin Redbreast, 9.
Common Whitethroat, 3.
Lesser Whitethroat, 2.
Dartford Warbler, 1.
Blue throated Warbler, 1.
Black Redstart, 1.
Redstart, 5.
Wood Warbler, 7.
Willow Warbler, 10.
Chiff-chaff, 9.
Golden-crested Regulus, 9.
Fire-crested Regulus, 1.
Common Wren, 4.
Wheat-ear, 1.
Whinchat, 1.
Stonechat, 1.
Alpine Accentor, 1.
Hedge Accentor, 6.
Pied Wagtail, 3.
White Wagtail, 1.
Grey Wagtail, 1.
Grey-headed Wagtail, 8.
Ray's Wagtail, 1.
Richard's Pipit, 1.
Rock Pipit, 1.
Meadow Pipit, 3.
Tree Pipit, 2.
Shore Lark, 1.
Skylark, 7.
Crested Lark, 1.
Short-toed Lark, 1.
Great Tit, 23.
Coal Tit, 2.
Blue Tit, 9.
Marsh Tit, 1.
Long-tailed Tit, 6.
Crested Tit, 1.
Bearded Tit, 1.
Yellow Bunting, 5.
Common Bunting, 2.
Black-headed Bunting, 6.
Ortolan Bunting, 3.
Cirl Bunting, 2.
Bullfinch, 5.
Hawfinch, 1.
Greenfinch, 11.
House Sparrow, 9.
Tree Sparrow, 1.
Chaffinch, 5.
Linnet, 11.
Mountain Linnet, 1.
Redpole, 1.
Goldfinch, 1.
Mealy Redpole, 1.
Common Cuckoo, 1.
Green Woodpecker, 1.
Great Spotted Woodpecker, 1.
Lesser Spotted Woodpecker, 1.
Wryneck, 1.
Nuthatch, 1.
Common Creeper, 1.
Kingfisher, 2.
Swallow, 7.
Martin, 3.

Sand Martin, 2.
Common Swift, 2.
Goat Sucker, 2.
Raven, 1.
Carrion Crow, 2.
Rook, 12.
Jackdaw, 9.
Magpie, 6.
Jay, 8.
Golden Oriole, 1.
Starling, 4.
Woodchat Shrike, 1.
Redbacked Shrike, 7.
Spotted Flycatcher, 1.
Pied Flycatcher, 1.
Missel Thrush, 6.
Field-fare, 1.
Song Thrush, 5.
Redwing, 1.
Ring Ouzel, 1.
Blackbird, 3.
Dipper, 1.
Merlin, 2.
Kestrel, 6.
Sparrow-hawk, 8.
Kite, 1.
Common Buzzard, 1.
Hawk Owl, 1.
Tawny Owl, 2.
White Owl, 1.
Short-eared Owl, 1.
Long-eared Owl, 1.

Lapwing, 4.
Common Heron, 1.
Purple Heron, 1.
Common Bittern, 1.
Little Bittern, 1.
Avocet, 1.
Spoon Bill, 1.
Common Curlew, 1.
Dunlin, 1.
Ruff, 3.
Common Redshank, 1.
Wood Sandpiper, 1.
Common Sandpiper, 2.
Black-tailed Godwit, 1.
Common Snipe, 2.
Landrail, 9.
Spotted Crake, 1.
Moorhen, 4.
Common Coot, 3.
Great-crested Grebe, 1.
Little Grebe, 6.
Sandwich Tern, 1.
Common Tern, 1.
Arctic Tern, 1.
Glaucous Gull, 1.
Iceland Gull, 1.
Herring Gull, 1.
Great Blackbacked Gull, 1
Common Gull, 2.
Laughing Gull, 1.
Kittiwake Gull, 1.
Black-headed Gull, 2.

Ring Dove, 4.
Stock Dove, 3.
Rock Dove, 1.
Turtle Dove, 1.
Pheasant, 1.
Capercaillie, 1.
Black Grouse, 1.
Red Grouse, 2.
Ptarmigan, 2.
Rock Ptarmigan, 2.
Partridge, 4.
Red-legged Partridge, 1.
Quail, 4.
Thick-knee, 1.
Oyster Catcher, 3.
Golden Plover, 1.
Storm Petrel, 1.
Gold and Silver Pheasants, 4
Wild Duck, 1.
Eider Duck, 1.
Smew, 1.
Cormorant, 1.
Gannet, 1.
Common Guillemot, 7.
Black Guillemot, 1.
Puffin, 1.
Razor-bill, 3.
Great Auk-model.

456 eggs.
163 species.

ARCHÆOLOGY.

The meetings of this Section have been far from numerous, owing to want of members, but a good deal has been done in the way of exploring by those few. Amongst others the camps at Chisbury and Oldbury have been visited, as well as most of the neighbouring churches and objects of interest. Of the donations to the Section the most interesting are, a large collection of flint implements from Yorkshire by E. C. Scobell, Esq., a Chinese soldier's badge of merit by Mr. Chivers of Marlborough, and a piece of cement from Stonehenge

by Mr. Baverstock. The coin collection has been greatly increased. The principal donations are by the Rev. C. Soames, of Mildenhall, the Rev. E. B. Warren, E. C. Sewell, C. E. G. Crawford and others. Three papers have been read in connection with this section; viz. by S. Image on Monumental Brasses, by E. C. Sewell on the Roman Villa at Chedworth, and by W. D. Fenning on English Coins.

COLLECTION OF BRITISH COINS.

SILVER COINS.

Edward I. penny.
Edward III. groat, half-groat.
Henry IV. penny.
Edward VI. shilling.
Elizabeth, shilling, sixpence, three half-pence, three-farthings.
James I. penny.
Charles II. sixpence, twopence.
William and Mary, twopence.
Anne, shilling.
George II. shilling, sixpence.
George III. threepence.
Victoria, twopence, three-half-pence, penny.

COPPER COINS.

Charles II. farthing.
William and Mary, half-penny.
William III. half-penny.
George I. farthing, half-penny.
George II. farthing.
George III. half-penny (1770), twopence, penny (1797), penny, half-penny, (1806).
George IV. half-penny, farthing.
Victoria, penny (1858), farthing, mite.

The Roman and foreign coins are not yet arranged.

BOTANICAL NOTICES.

On our return in August, the country was just recovering from a long and excessive drought, and though a fair number of plants were in flower, it must be observed that very few were in any abundance, many of them occurring only in damp places. During September plants began to recover rapidly and many put forth a second crop of flowers. The weather in October was very cold and wet, consequently many plants were completely killed. Some, however, still continued to put forth a few flowers, and were not entirely killed at the time of our departure in December. The latter half of November was warm, and some few plants came into flower—e.g., Gentiana acaulis, and in December both blue and pink Hepaticas were coming into bloom. Trees generally were leafless after the frosts and high winds in the beginning of November.

I have to thank many members of the School for the great assistance rendered to me in obtaining materials for the subjoined list; some never left their names in my room, but among those who did so I must mention the Rev.

J. Sowerby, W. Mansell, Esq., A. de B. Hovell, S. Shearburn, G. C. Mansel, H. M. Hilton, W. Willimott, E. im Thurn, F. Giles.

In the follwing list, *a* indicates that the plant was observed in flower on Aug. 24, *s* on September 26, *o* on October 1, *n* on Nov. 1, 2, or 12, and *d* on Nov. 26, Dec. 1, or 5. A single letter indicates that only a few flowers were observed, two letters that the plant was commonly in flower, and three letters that it was in full flower. Thus *Sinapis arvensis* was only just in flower during August and September, but was very plentiful during October and November becoming scarce again in December.

Anemone Hepatica	a few in flower December 18.					
Ranunculus acris	a	s	oo	n	d	not observed aft. Dec. 5.
R. repens	a	—	oo	n	—	,, ,, Nov. 2.
Caltha palustris	—	s	o	—	—	single specimens only.
Papaver Rhœas	a	s	—	—	—	rare on both occasions
Fumaria officinalis	a	s	ooo	nn	d	continued in flower all the year.
Nasturtium officinale... ...	a	s	o	—	—	not common.
Cardamine hirsuta	—	s	o	—	—	very scarce.
Alliaria officinalis	—	—	—	n	—	only one specimen.
Sinapis arvensis	a	s	ooo	nnn	d	very scarce on Aug. 24 and Dec. 15.
S. alba	a	s	o	n	—	
Capsella Bursa-pastoris ...	—	s	oo	nn	d	
Helianthemum vulgare ...	a	s	—	—	—	very scarce Aug. 24.
Viola sylvatica (b)	—	—	o	—	—	
V. tricolor (arvensis)	a	—	o	—	—	
Polygala vulgaris...	a	—	o	—	—	very scarce Oct. 1.
Silene inflata	—	Sep.8—		—	—	
Lychnis vespertina	—	Sep.8—		—	—	
L. diurna	—	Sep8 o (at Devizes).				
Sagina procumbens	—	—	o	—	—	
Stellaria media	—	—	o	nn	d	could not be found in flower before Oct.
S. graminea...	—	s	—	—	—	
Cerastium glomeratum ...	a	s	o	n	d	never plentiful.
Malva moschata	—	—	—	n	d	scarce.
M. sylvestris	—	s	oo	n	d	
M. rotundifolia	—	s	o	n	d	
Hypericum quadrangulum...	a	s	o	—	—	
H. perforatum	a	s	—	—	—	very scarce.
H. hirsutum	a	—	—	—	—	ditto
Geranium pratense	—	—	—	n	—	ditto
G. dissectum	a	—	—	—	—	ditto
G. Robertianum	—	s	oo	n	—	

Erodium Cicutarium	—	—	o	—	—	
Linum Catharticum	a	—	—	—	—	very scarce.
Ulex Europæus	—	—	o	n	d	
Lotus Corniculatus	a	s	—	—	—	
Medicago Lupulina	a	—	—	—	—	very scarce
Trifolium pratense	a	s	oo	n	—	
T. arvense	a	—	—	—	—	
T. repens	a	s	o	—	—	
T. procumbens	a	s	—	—	—	
T. minus	a	s	—	—	—	
Vicia Cracca	a	—	—	—	—	
V. sepium	—	—	o	—	—	
Spiræa Ulmaria	a	s	o	n	—	very scarce always
Agrimonia Eupatoria... ...	a	s	o	—	—	
Potentilla anserina	a	—	o	—	—	could not be found in Sept.
P. Tormentilla	—	—	o	—	—	
Rubus (fruticosus)	a	—	o	—	—	
R. cæsius	—	s	oo	n	—	
Geum Urbanum	—	s	o	n	—	
Epilobium hirsutum	aa	—	—	—	—	quite over in Sept.
E. parviflorum	—	s	o	—	—	
Scleranthus annuus	—	s	—	—	—	
Pimpinella Saxifraga ...	a	s	ooo	nn	d	
Sium angustifolium	a	s	o	—	—	
Æthusa Cynapium	a	s	o	—	—	
Angelica sylvestris	a	s	o	n	—	always scarce
Pastinaca sativa	—	—	o	n	d	ditto
Heracleum sphondylium ...	a	s	oo	n	—	
Daucus Carota	a	s	—	—	—	
Torilis Anthriscus	a	—	—	—	—	
Scandix Pecten	—	—	—	n	—	
Chærophyllum Temulum ...	—	s	—	—	—	
Hedera Helix (flower) ...	—	—	o	—	—	
Cornus sanguinea	—	s	o	n	—	In bud in Sep. and Oct. a second flowering.
Viburnum lantana	—	—	o	—	—	Second flowering,
Lonicera Periclymenum ...	—	s	o	—	—	
Asperula Cynanchica ...	a	—	—	—	—	very scarce
Galium Aparine...	—	—	—	n	—	
G. Mollugo...	a	—	o	—	—	
G. verum	a	s	o	n	—	
Knautia arvensis	a	s	oo	n	d	
Scabiosa succisa	a	—	o	—	—	

S. Columbaria	a	s	o	n	d	
Bellis Perennis	—	s	oo	n	d	all the rest of the year.
Achillea millefolium	aa	ss	ooo	nn	dd	over about the 15th Dec.
Matricaria inodora	a	s	o	n	d	
Gnaphalium uliginosum ...	—	—	o	—	—	
Senecio vulgaris	aa	ss	ooo	nn	dd	
S. Jacobsea	a	s	ooo	nn	d	
S. aquaticus	a	s	o	n	—	
Centaurea nigra	a	s	o	n	—	a single specimen in Nov.
C. Scabiosa	a	s	o	—	d	„ in Dec.
Carduus Crispus	—	s	o	n	—	
C. lanceolatus	a	—	—	—	—	
C. eriophorus	a	—	—	—	—	
C. arvensis	a	—	o	—	—	very scarce
C. palustris	a	—	o	n	—	
C. acaulis	a	—	—	—	—	
Lapsana communis	a	—	o	—	—	
Pulicaria dysenterica	a	—	—	—	—	
Apargia autumnalis	aa	ss	ooo	nn	d	
A. hispida	—	—	o	—	—	
Helminthia echioides ...	—	—	o	—	—	
Leontodon Taraxacum ...	aa	ss	ooo	nn	d	
Sonchus oleraceus	—	—	o	—	—	
S. asper	a	s	o	n	—	
S. arvensis	a	s	—	—	—	
Crepis virens	a	s	o	n	d	
Campanula glomerata ...	a	—	—	—	—	
C. rotundifolia.	a	s	oo	n	—	
Gentiana Amarella	—	s	o	—	—	
G. campestris	a	—	—	—	—	
G. acaulis	—	s	—	n	—	
Convolvulus arvensis	a	—	o	—	—	
C. sepium	aa	s	o	—	—	
Cynoglossum officinale ...	—	—	o	—	—	
Borago officinalis	a	—	o	n	d	
Symphytum officinale ...	—	s	o	—	—	
Myosotis palustris	aa	s	o	n	—	
M. arvensis	a	—	o	—	—	
Solanum dulcamara	a	—	—	—	—	
Linaria vulgaris	a	s	oo	—	—	
Scrophularia aquatica ...	a	s	—	—	—	
Melampyrum pratense ...	a	—	—	—	—	
Euphrasia officinalis	a	s	o	—	—	

E. odontites	a	s	—	—	—	
Veronica Anagallis	a	—	o	—	—	
V. Beccabunga	a	—	—	—	—	
V. agrestis	—	—	—	n	—	
V. polita	—	s	o	n	d	
V. Buxbaumii	—	s	o	n	d	
Mentha aquatica	a	s	o	—	—	
M. arvensis...	—	—	o	—	—	
Thymus Serpyllum	—	—	o	—	—	
Calamintha Clinopodium ...	a	s	o	—	—	
Prunella vulgaris	a	s	o	—	—	
Lamium amplexicaule ...	—	—	o	—	d	
L. purpureum	—	s	o	n	d	
L. album	aa	ss	ooo	nn	d	
L. maculatum	—	—	—	—	d	
Galeopsis Ladanum	a	—	—	—	—	
G. Tetrahit	—	—	o	n	—	
Ballota fœtida	a	s	o	—	—	
Stachys betonica	—	—	o	—	—	
S. sylvatica...	—	—	o	—	—	
S. palustris...	a	—	—	—	—	
Anagallis arvensis	a	s	o	—	—	scarce
Plantago lanceolata	a	s	o	n	—	do.
P. media	a	s	—	—	—	
Chenopodium album	—	s	o	n	—	
Atriplex patula	a	s	o	—	—	
Rumex conglomeratus ...	—	s	o	—	—	
R. obtusifolius	a	s	o	—	—	
R. crispus	a	s	o	n	—	
Polygonum Persicaria ...	—	—	o	—	—	
P. amphibium	a	—	—	—	—	
P. aviculare...	a	s	o	n	d	
P. convolvulus	a	s	o	—	—	
Euphorbia Helioscopia ...	a	s	o	n	—	
E. Peplus	—	s	o	n	d	
Urtica urens	—	s	o	n	—	
U. dioica	a	s	o	n	—	
Juncus conglomeratus ...	a	—	—	—	—	
J. glaucus	a	—	—	—	—	
J. lamprocarpus	a	—	—	—	—	
Eleocharis palustris	a	—	—	—	—	
Alisma Plantago	a	—	—	—	—	
Sparganium ramosum ...	a	—	—	—	—	

Phleum pratense	a	—	—	—	—
Alopecurus geniculatus ...	a	—	—	—	—
Holcus lanatus	a	s	—	—	—
Arrhenatherum Avenaceum	a	s	o	—	—
Poa annua	a	s	o	n	d
Glyceria aquatica	a	s	—	—	—
G. plicata	a	—	o	—	—
Dactylis glomerata	a	s	—	n	—
Festuca gigantea	—	—	—	n	—
F. arundinacea	—	s	—	n	—
Hordeum pratense	a	—	—	—	—
Lolium perenne	a	s	—	n	—
Arundo phragmites	—	s	—	—	—

NEW SPECIES AND LOCALITIES.

Erodium cicutarium	In a field near the Bath Road about a mile from Marlborough. Probably sown with other seed.
Trifolium arvense	Discovered in plenty at Mildenhall by F. Storr, Esq.
Soleranthus annuus	At Mildenhall and on Martinsell.
Helminthia Echioides ...	At Martinsell, found by A. de. B. Hovell.
Festuca arundinacea	At Mildenhall.
Hordeum pratense	At Poulton.

DONATIONS TO THE MUSEUM
DURING THE HALF-YEAR.

Entomology.—Specimen of *A. Lathonia*, from Switzerland, by Rev. A. G. Butler.

A collection of Moths, from A. Marshall, Esq.

A collection of Indian Moths, by C. N. Lawrence.

Pair of *Colias Hyale*, by J. S. Woodhouse.

Pair of Foreign Beetles, by — Fullerton.

Specimen of *S. Convolvuli*, by E. im Thurn.

Two specimens of *S. Convolvuli*, by the President.

Specimen of *D. Livornica*, by F. E. Thompson, Esq.

Three specimens of *P. Arion*, by Mr. Nicholls.

Collection of Foreign Beetles, &c., by C.W.Elwes, Esq., M.D.

Wasp's Nest, 37 inches in circumference, by Dr. Fergus.

Ornithology.—Specimen of Bee-eater, from Spain, by E. S. Preston.

Stuffed specimen of Quail *(Coturnix vulgaris)*, by G. H. Dawson, Esq.

Skins of Golden and White-tailed Eagles (*A. Chrysaetos* and *H. albicilla*) by the President.

Skin of variety of common Linnet (*F. Cannabina*) by S. A. Rogers.

Stuffed specimens of Black-winged Stilt (*H. melanopterus*) and young Stone Curlew (*Æ.crepitans*), by E.im Thurn.

White variety of common Pheasant, by Mr. G. Gauntlett.

Egg of Kentish Plover (*C. cantianus*), by A. C. Preston.

Eggs of Norfolk Plover, &c., by A. C. Almack, Esq.

Botany.—A collection of Ferns, by J. B. Oakeley.

Indian Gourd, by Mr. Hawkins.

Collection of dried Fungi, by A. C. Almack, Esq.

Geology.—A collection of Fossils, by H. S. Sankey.

Fossils from Bognor and Dorsal Vertebræ of *Ptychodus*, by F. Giles.

Mineralogy.—Specimen of Epidote (Zoisite) from St. Gothard, by S. B. Dixon, Esq.

Collection of 24 minerals to complete the representative collection, by the President.

Collection of minerals, by Rev. J. Sowerby.

Specimen of Dog-tooth Spar, by F. Giles.

Archæology.—A large collection of Flint Implements, by E. C. Scobell, Esq.

A collection of 75 coins, by E. C. Sewell.

A collection of 50 coins, by C. E. G. Crawford.

Golden Rupee, by C. F. Harrison.

A collection of 65 Roman Coins, by Rev. C. Soames.

Various coins by H. R. Armstrong, Rev. E. B. Warren, C. J. Irwin, and Mr. Chivers.

Chinese silver Badge of Merit, by Mr. Chivers.

Specimens of Cement from Stonehenge, by Mr. Baverstock.

Rubbings of Monumental Brasses, by S. Image, Esq.

Zoology.—Land Crab, from India, by Mr. Harraway.

Jaw of Young Shark, from Barbadoes, by Mr. Hawkins.

Sponge and two Turtles' heads by Mr. Hawkins.

Queen Shell *(C. Chione)* covered with Serpulæ, by Mr. Chate.

Skull of Child, showing first and second Dentition, by J. Walker, Esq., M.D.

Skeleton of Bull Terrier, and Skulls of Lion and Rabbit by J. Walker, Esq., M.D.

Specimens of Pipe-fish and Hippocampus by C. W. Elwes, Esq , M.D.

Miscellaneous.—Portrait of the President, by Mr. Baverstock.

Chinese Paintings, by C. J. Irwin.

Chinese Bank Note (value 7½d.) and Visiting Card, by R. B. C. Everard, Esq.

Books.—Figuier's "Insect World," by Rev. G. W. De Lisle.

White's "Natural History of Selborne," by F. Madan.

The "Student" and "Popular Science Review" for the half-year, by Rev. J. M. Fuller.

The "Ibis," "Entomologist," and "Entomologist's Monthly Magazine," for the Half-year, by the President.

SALE OF REPORTS.

No. printed...	402
No. sold	330
— given away	56
— in hand	16
	402

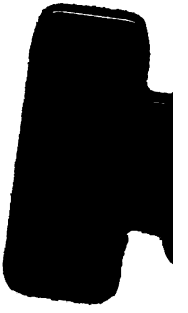
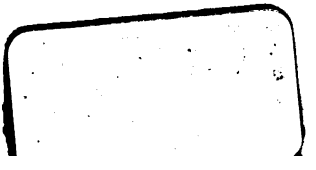
—:o:—

ACCOUNTS.

	£	s.	d.		£	s.	d.
Balance in hand	1	5	10	Photograph of Map in Report	13	6	8
Subscriptions	6	2	0	Printing Report for Mids.	22	0	0
Donations and arrears ...	2	16	0	Cabinets, &c.	9	19	0
Sale of Back Reports ...	0	1	0	Books	0	11	3
——— Report for Mids. ...	41	5	0	Sundries	0	19	11
				Balance in hand	4	13	0
	£51	9	10		£51	9	10

DONATIONS.

	£	s.	d.
A. Armstrong, Esq., ...	0	2	6
F. J. H. Jenkinson	0	1	0
R. Hunter, Esq.	1	1	0
G. H. Dawson, Esq.	0	5	0
Mr. Stubbs	0	10	6
A. C. Almack, Esq.	0	2	6
Rev. J. Sowerby	0	2	6
G. K. Mills, Esq.	0	7	6
Smaller	0	0	6

(Signed) G. E. MANISTY, F. GILES } Auditors.

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